Missouri
EPIDEMIOLOGIST

Vol. IX, No. 1 *January / February 1987*

Report of an Illness Outbreak at the Truman State Office Building

Introduction

Indoor air quality has been recognized in recent years as a factor influencing employee illness in a variety of industrial and office settings. Poor ventilation and limited fresh air intake in many modern buildings have contributed to outbreaks of illness referred to as the "tight building syndrome."[1]

Mass hysteria, also called epidemic transient situational disturbance, has been a diagnosis of exclusion. It primarily affects adolescent or preadolescent females, is related to stress and transmitted by sight and sound. The epidemic usually ends promptly after the diagnosis is announced.[2]

The Harry S Truman State Office Building (HSTOB), an eight-story office building, is the workplace for 2,500 state employees.

On the morning of June 18, 1986, 50 employees became ill at the HSTOB in Jefferson City, Missouri. Emergency medical personnel were called to the scene, and many employees were treated at local hospital emergency rooms. The building was evac-uated as a safety precaution. The employees re-turned on Thursday, June 19, and additional peo-ple became ill that day and on Friday, June 20.

Environmental inspection and testing were conducted by the Department of Health (DOH) and Department of Natural Resources (DNR) during the outbreak and for several days afterwards. Public health nurses were assigned to the HSTOB to attend ill employees and to gather information about their symptoms. An epidemiologic investigation of the outbreak was conducted.

Methods and Findings

A questionnaire was administered to employees during the week following the outbreak. A total of 305 persons who reported having symptoms on June 18, 19, or 20 were identified as cases, for an overall building attack rate of 12.1%. Persons working in the same areas who did not have symptoms were selected as controls; 131 completed the questionnaire.

Cases and controls did not differ significantly with respect to age or employment status (temporary vs. regular). There were more women in the case group (90.4% vs. 81.5% of the controls). A higher proportion of cases than controls had annual salaries below $9,000 (71.6% vs. 60.6%).

Overall, 30% of the employees interviewed classified themselves as smokers and 27.5% indicated they smoked while at work. The case and control groups did not differ significantly on this variable. A high proportion of both groups indicated they were exposed to cigarette smoke from workers in their vicinity. This and other perceived conditions in the work area are shown in Table 1. *(continued on page 2)*

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Table 1
Perceived Conditions in the Work Area

Condition	Cases	Controls	Level of Significance*
Low air flow	72.2%	51.5%	p<.001
Too warm	45.6%	32.6%	p<.01
Too cold	18.4%	13.2%	p<.01
Crowded	52.2%	49.6%	NS
Exposed to cigarette smoke	80.2%	82.0%	NS
"Particular" odor	68.9%	32.1%	p<.001

*Chi square test

A much higher proportion of cases than controls indicated they had noticed a particular odor in the work area recently (68.9% vs. 32.1%). However, there was very little agreement within either group as to the character or identity of the odor. Significantly more cases than controls perceived the work area to be too warm or too cold, and to have low air flow.

Most of the affected persons (288/305, or 94.4%) first became ill on Wednesday, June 18. Only 16 people who reported no symptoms on Wednesday became ill on Thursday, and one reported symptoms for the first time on Friday. The majority (180, or 59%) reported symptoms on all three days.

Most cases occurred early in the day. The peak was between 9 a.m. and 10 a.m. on Wednesday; on Thursday and Friday, the cases peaked before 9 a.m.

The majority of cases did not require treatment. During the three-day period, there were 67 hospital emergency room visits reported, 62 reports of treatment at the HSTOB, and three reports of admission to hospital for observation.

A wide range of symptoms were reported, the most common being headache, reported by 81% of the cases. Five other symptoms were reported by at least half of the cases: nose/throat or eye irritation; fatigue; odd taste in the mouth; and dizziness. More than 20 other symptoms were reported with lesser frequency.

Attack rates varied widely in different parts of the building. The highest quadrant attack rates were in 3-South (43%) and 4-South (33%). Individual units within these quadrants had a wide range of attack rates: 17%-81% on 3-South and 15%-60% on 4-South. Forty cases (13% of the total) occurred on other floors.

Extensive air monitoring was conducted and revealed no toxic or explosive gases present. Carbon dioxide sampling detected only one moderate elevation of 1450 ppm at 3 p.m. on June 19 on 3-South. Seventy-two other monitoring observations from 2-, 3-, 4- and 7-South and 3-North were within normal limits.

The HSTOB has 17 separate ventilation systems: one for each half of each floor, and one for the central atrium. No air exchange between systems occurs at any point. Air intake vents for all the systems are located in close proximity on two sides of the building. Air circulation is continuous within each of the systems, and is controlled by thermostat in each area.

Discussion

The pattern of symptoms in this outbreak is rather diffuse but typical of epidemic psychogenic illness. The symptoms are consistent with those noted in other such outbreaks. [2-5]

It appears that a combination of crowding, smoking, low fresh air ventilation rates, and widespread use of a variety of chemicals to service office machines created stressful conditions sufficient to induce illness in some individuals. Many employees perceived odors and apparently became more aware of their own responses to chemical and cigarette smoke in poorly ventilated areas.

Other workers observed and heard about the illness. Many saw several emergency vehicles and numerous police, fire and medical personnel who were called to the scene. Rumors about toxic gas, other employee illnesses, and evacuation probably increased the level of stress and anxiety among the employees.

The continuation of symptoms and recurrences of illness after the initial outbreak has been seen in other industrial, school, and office outbreaks of psychogenic origin.

DOH recommended that measures be taken to reduce or eliminate smoking in work areas, increase air circulation, reduce the use of office chem-

icals, reduce office crowding, and provide an occupational health program. Since the episode, air circulation has been improved and the use of chemicals reduced. No further outbreak of illness has been reported.

References

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2. Nitzkin, Joel L., M.D., M.P.H., Epidemic Transient Situational Disturbance in an Elementary School. *Journal of Florida Medical Association*, Vol. 63, No. 5, May 1976:357-359.
3. Centers for Disease Control, Epidemic Psychogenic Illness in an Industrial Setting—Pennsylvania. *MMWR*, Vol. 32, No. 22, June 10, 1983:287-288, 294.
4. Levine, Richard J., M.D., Epidemic Faintness and Syncope in a School Marching Band. *JAMA*, Vol. 238, No. 22, November 28, 1977:2373-2376.
5. Centers for Disease Control, Epidemic of Acute Illness—West Bank. *MMWR*, Vol. 32, No. 16, April 29, 1983:205-208. ■

The Treatment of Tuberculosis and Tuberculosis Infection in Adults and Children

The Missouri Department of Health has adopted the recently published guidelines of the Centers for Disease Control and the American Thoracic Society for the treatment and prevention of tuberculosis.* These guidelines presented in the joint statement are summarized below:

Treatment of Tuberculosis Disease:

1. A 6-month regimen consisting of isoniazid, rifampin, and pyrazinamide given for 2 months followed by isoniazid and rifampin for 4 months is effective treatment in patients with fully susceptible organisms who comply with the treatment regimen. It may be advisable to include ethambutol in the initial phase when isoniazid resistance is suspected.

2. A 9-month regimen consisting of isoniazid and rifampin is also highly successful. The need for an additional drug in the initial phase is not certain unless isoniazid resistance is suspected, in which case ethambutol should be included until susceptibility tests have been reported.

3. In the presence of documented resistance to isoniazid, rifampin and ethambutol, perhaps supplemented initially by pyrazinamide, should be given for a minimum of 12 months.

4. Children should be treated in essentially the same ways as adults, using appropriately adjusted doses of the drugs. The clinical progress must be more carefully monitored in very young children to prevent rapid development to drug toxicity or dissemination of tuberculosis.

5. Extrapulmonary tuberculosis should be managed according to the principles outlined for pulmonary tuberculosis and using the same drug regimens.

6. The major determinant of the outcome of treatment is patient compliance. Careful attention should be paid to measures designed to ensure that patients take the drugs as prescribed.

Treatment of Tuberculosis Infection:

1. Preventive therapy with isoniazid given for 6 to 12 months is effective in decreasing the risk of future tuberculosis disease.

2. Persons for whom preventive therapy is indicated include household members and other close contacts of potentially infectious persons, newly infected persons, persons with past tuberculosis disease or with a significant tuberculin reaction and abnormal chest films in whom current tuberculosis has been excluded, infected persons in special clinical situations such as silicosis, diabetes mellitus, adrenocorticosteroid therapy, immunosuppressive therapy or diseases, AIDS, or positive tests for antibodies to AIDS virus, hematologic and reticuloendothelial malignancies, end-stage renal disease, and clinical conditions associated with rapid weight loss or chronic undernutrition, and tuberculin skin test reactors younger than 35.

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* American Thoracic Society, Centers for Disease Control. Treatment of tuberculosis and tuberculosis infection in adults and children. *Am. Rev. Respir. Dis.* 1986; 134: 355

3. In persons younger than 35 years of age, routine monitoring for adverse effects of isoniazid should consist of a monthly symptom review. For persons 35 and older, in addition to monthly symptom reviews, hepatic enzymes should be measured prior to starting isoniazid and periodically throughout treatment.

4. Persons at high risk of developing severe forms of tuberculosis disease, if infected due to contact with a patient having isoniazid-resistant organisms, should be treated with rifampin rather than isoniazid. Lower-risk contacts can be treated with isoniazid and observed carefully.

5. As with treatment of tuberculosis disease, the key to success of preventive therapy is patient compliance.

Copies of the complete joint statement of the Centers for Disease Control and the American Thoracic Society are available by contacting the Bureau of Tuberculosis Control at P.O. Box 570, Jefferson City, Missouri, 65102 or by calling (314)751-6122 or 1-800-392-0272. ■

SSPE Case Identified by State Public Health Laboratory

John Goins and Mahree Bright

The State Public Health Laboratory recently identified its first case of subacute sclerosing panencephalitis (SSPE). This condition is associated with a chronic infection of the central nervous system by the measles virus.

Enzyme immunoassay (EIA) and complement fixation (CF) tests were used to determine the amount of measles antibody in spinal fluid (CSF) and serum. The ratio of the quantity of measles antibody in CSF to the quantity of measles antibody in serum was the significant finding leading to the diagnosis of SSPE. The diagnosis of SSPE cannot be made solely on a clinical basis, and requires this type of serologic study.

The case occurred in a two-year-old white female who had a history of a rash illness with high fever when she was two months old (June, 1984). Measles was apparently not suspected at the time, and the case was not reported to the Department of Health. There was no known measles activity in central Missouri in 1984. Only six cases were confirmed statewide that year. The child later received an MMR immunization at age 15 months.

The child developed progressive neurologic deterioration over a period of several weeks in late 1986, affecting her physical coordination, speech, vision, and hearing. After three weeks, she began displaying myoclonic movements, which gradually progressed to a continuous movement while awake. She was hospitalized, and her hospital course was complicated by pneumonia. The myoclonus was brought under control, but her condition was otherwise basically unchanged upon discharge.

Historically, SSPE has mainly affected adolescents. The incidence of SSPE has declined steadily nationwide since measles vaccine came into widespread use. This was the first case to be identified by the State Public Health Laboratory. ■

Influenza Cases Confirmed

The A/Taiwan/86 (H1N1) influenza strain reached Missouri in December. Influenza activity continued to increase through January and peaked in mid-February. By the end of February, 59 cases of A/Taiwan influenza hadbeen confirmed by laboratory testing. Two cases of A/Chile/83 (H1N1) were confirmed, as well as four additional Type A (H1N1) which could not be typed further. No Type B or Type A (H3N2) influenza has been identified in Missouri yet this season.

Reports of influenza-like illness received through the active disease surveillance system have risen from 440 during the last week of September to over 4,500 in the last week of January. Since then, the reported totals have begun to decline, to under 2,500 cases in the last week of February. Most of the reported illnesses have occurred in school-age children and adolescents.

The largest number of A/Taiwan cases (29) have been confirmed in the Eastern District, which includes St. Louis. Eleven were from the Central District, seven from the Southeastern District. Six were from the Southwestern District, which inlcludes Springfield. Four cases were from the Northwestern District, which includes Kansas City, and two from the Northeastern District.

The A/Taiwan cases range in age from one month to 81 years. However, only two were over 35 years old, and 13 were infants under one year of age. This pattern is consistent with that observed in other states, and reflects the predicted incidence of the A/Taiwan strain. In contrast, the A/Chile cases occurred in persons age 28 and 67 years. ■

Toxic Shock Syndrome and Bacterial Meningitis/Bacteremia Studies, 1986

Sandra L. Sitze, MSN, RN

The Missouri Department of Health participated throughout 1986 in a national research project under the direction of the Centers for Disease Control (CDC), along with New Jersey, Tennessee, Kentucky, Washington, and Los Angeles county. Cases of toxic shock syndrome (TSS) and invasive diseases due to *N. meningitides*, *H. influenzae*, *S. pneumoniae*, group B streptococcus, and *L. monocytogenes* have been monitored through reports from physicians, infection control practitioners (ICP), and clinical laboratories. This has been done through an active ICP and laboratory based surveillance program. (Previous report on TSS appeared in *Missouri Epidemiologist*, March - April 1986, issue.)

H . INFLUENZAE

Through the active surveillance system 656 cases for all clinical presentations were reported between July and December 1986. Of these, 180 (27.4%) were invasive disease due to *H. influenzae* (Table 1). Fifty-four percent of the cases were male; seven have died (case fatality rate of 3.9%). Incidence of cases in whites is equal to two times that in the other groups combined. Of the 180 *H. influenzae* cases reported, 127 were meningitis. Eighty percent of the cases were in children less than five years of age (Table 2). Twenty percent of children attended day care/baby sitters (day care status not verified in 32 cases.

While the total number of cases of invasive disease due to all organisms was 1,142, *H. influenzae* accounted for 317 (27.8%) in 1986.

TOXIC SHOCK SYNDROME

From July through December 1986, 29 cases of TSS were reported. Of these, 13.8% were male. Menstrual-associated cases represented the largest percentage (45%), while post-partum related cases are the least (3%).

Only one case was reported associated with a contraceptive sponge. No deaths were reported among TSS cases during this interval. The year's total cases of all TSS was 43.

The study will continue through June 1987. The extension involves only TSS cases and invasive disease due to *H. influenzae* and *L. monocytogenes*. The need for the extension was threefold as follows:

1. TSS - More cases are necessary to evaluate the risk associated with the contraceptive sponge.

2. *H. influenzae* - More cases are necessary to make a better estimated true vaccine efficacy.

3. *L. monocytogenes* - The case-control phase of this study was only begun in July, 1986, and a full year of data collection will be essential.

Laboratories have been asked to continue to send isolates of *H. influenzae* and *L. monocytogenes*, when cultured from any sterile body site, on chocolate agar slants to Maria Wallace, State Public Health Laboratory.

In addition, isolates of *S. aureus* are needed if associated with TSS. For questions or consultations call Sandra Sitze at (314) 751-6114 or (800) 392-0272.

The cooperation of physicians in both studies is appreciated. Our thanks to the ICP, lab personnel, and local/district health staff for their continued efforts at making the active surveillance program and the research study a success. ■

Table 1
Reported Cases of Bacterial Meningitis/Bacteremia 1986

	Jan - June*	%	July - Dec[x]	%	Total	%
N. Meningitides	17	3.5	23	3.5	40	3.5
H. influenzae	137	28.2	180	27.4	317	27.8
S. pneumoniae	255	52.5	249	38.0	504	44.1
L. monocytogenes	10	2.0	17	2.6	27	2.4
group B streptococcus	47	9.7	114	17.4	161	14.1
Other	20	4.1	73	11.1	93	8.1
Total	486	100	656	100	1142	100.0

* Does not include 19 incomplete cases
x Does not include 28 incomplete cases

TABLE 2
H. INFLUENZAE CASES BY AGE, 1986

	January - June		July - December		Total	
	# Cases	%	# Cases	%	# Cases	%
0 - 18 months	168	34.6	104	57.8	272	40.8
19-59 months	50	10.3	40	22.2	90	13.5
60+ months	268	55.1	36	20.0	304	45.7
Total	486	100.0	180	100.0	666	100.0

TABLE 3
H. INFLUENZAE CASES BY RACE, 1986

	January - June		July - December		Total	
	#Cases	%	# Cases	%	# Cases	%
White	356	73.2	122	67.8	478	71.8
Black	100.0	20.6	45	25.0	145	21.8
Amercian Indian	1	0.2	0	0	1	0.1
Asian	1	0.2	3	1.7	4	0.6
Hispanic	1	0.2	1	0.5	2	0.3
Other/Not Specified	27	5.6	9	5.0	36	5.4
Total	486	100.0	180	100.0	666	100.0

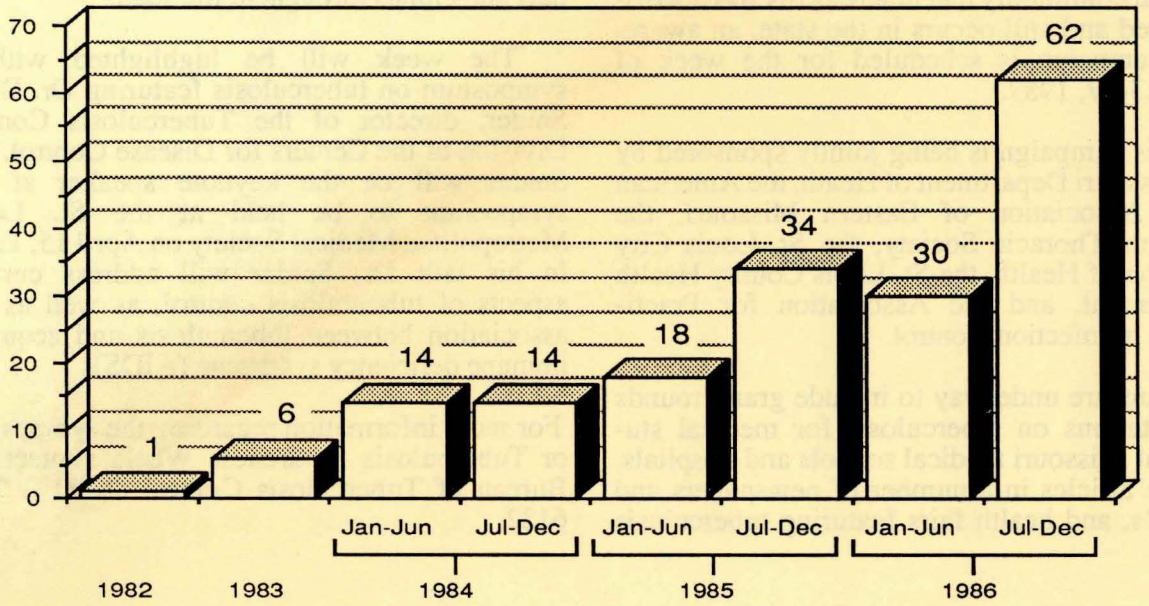
TABLE 4
REPORTED CASES OF TOXIC SHOCK SYNDROME, 1986

	Menstrual	Non Menst.	Postpart.	Male	Wound	Other	Total
January - June							
# Cases	8	7	0	(1)*	1	-	16
Percent	50	43.7	0	(6)*	6.3	-	100
July - December							
# Cases	11	4	1	(4.0)*	9	2	27
Percent	40.7	14.8	3.7	(14.8)*	33.3	7.5	100
Total							
#Cases	21	11	1	(5)*	10	2	43
Percent	46.7	24.5	2.2	(11.1)*	22.2	4.4	100

* Counted in wound category

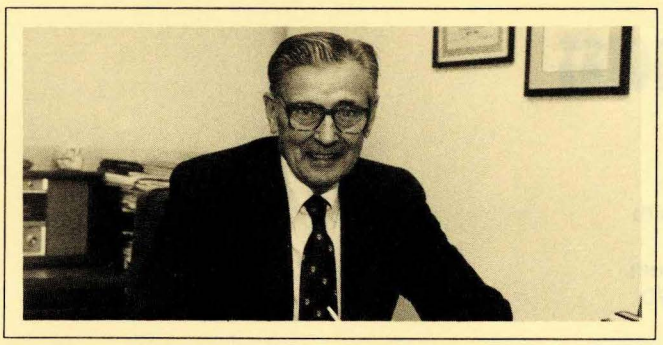
Reported AIDS Cases in Missouri
1982-1986

The number of new reported cases of AIDS in Missouri is expected to reach 600 by the year 1991. The cumulative case count (1982 - 1991) may be as high as 2,000.



Lab Director Retires

Dr. Spurrier Leaves Legacy at State Health Laboratory



Elmer R. Spurrier, Dr. P.H.

Last month, Elmer R. Spurrier, Dr. P.H., retired as the director of the Missouri State Public Health Laboratory after 20 years of service. When Dr. Spurrier left the lab, he left behind a legend spanning 35 years of outstanding achievement and a four-story laboratory — a monument to his leadership, his vision and, of course, his tenacity.

Dr. Spurrier was the driving force behind the establishment of the state health laboratory. Without his participation and ability to work with people across the political and governmental spectrum, the dream of a state health laboratory may never have been realized.

The state lab represents the epitome of Dr. Spurrier's desire to provide Missouri with the best public health laboratory services possible. That desire motivated his efforts to build a suitable laboratory facility and distinguishes his long and eventful career. Today, the lab is held in highest regard and respect by health professionals around the nation for its services.

Dr. Spurrier was the first graduate of the University of North Carolina Laboratory Director Program, receiving his doctorate in 1964. He has actively participated in professional statewide and national organizations, holding several offices including president of the Missouri Public Health Association in 1975. In 1983, he was presented the W. Scott Johnson Award by MPHA and in 1984 was awarded the Distinguished Alumni Award from the University of North Carolina School of Public Health Alumni Association.

So long, Elmer ... and thanks. ■

Tuberculosis Awareness Week set for April 13-17

As an activity to remind the public and the medical community that tuberculosis has not disappeared and still occurs in the state, an awareness campaign is scheduled for the week of April 13-17, 1987.

This campaign is being jointly sponsored by the Missouri Department of Heath, the American Lung Association of Eastern Missouri, the Missouri Thoracic Society, the St. Louis City Division of Health, the St. Louis County Health Department, and the Association for Practitioners in Infection Control.

Plans are underway to include grand rounds presentations on tuberculosis for medical students at Missouri medical schools and hospitals, feature articles in a number of newspapers and journals, and health fairs featuring tuberculosis awareness projects sponsored by various hospitals and clinics throughout the state.

The week will be highlighted with a symposium on tuberculosis featuring Dr. Dixie Snider, director of the Tuberculosis Control Division of the Centers for Disease Control. Dr. Snider will be the keynote speaker at the symposium to be held at the St. Louis Metropolitan Medical Society on April 15, 1987. In his talk Dr. Snider will address current aspects of tuberculosis control, as well as the association between tuberculosis and acquired immune deficiency syndrome (AIDS).

For more information regarding the symposium or Tuberculosis Awareness Week, contact the Bureau of Tuberculosis Control at (314) 751-6122. ■

Missouri EPIDEMIOLOGIST

Published by the
Missouri Department of Health
Division of Environmental Health
and Epidemiology Services
P.O. Box 570, 1730 E. Elm Street
Jefferson City, MO 65102-0570
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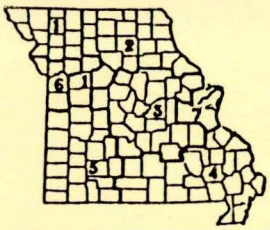


MISSOURI DEPARTMENT OF HEALTH – Epidemiology Services – Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period* November and December , 1986

	DISTRICTS							Kansas City	St. Louis City	St. Louis County	2 Month State Totals		Cumulative		
	1	2	3	4	5	** 6	** 7				1986	1985	for 1986	for 1985	5 Year Median
Vaccine Preventable Dis.															
Chickenpox	71	112	128	183	194	107	0	0	0	0	795	428	5093	2474	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	0	0	0	0	0	0	1	0	4	1	6	0	78	61	
Measles	0	0	0	0	1	0	0	0	0	0	1	2	32	5	
Mumps	0	2	2	0	0	1	0	0	0	1	6	5	23	18	
Pertussis	1	3	0	2	2	0	0	0	1	0	9	6	32	35	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	1	7	
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	2	3	
Viral Hepatitis															
A	0	0	2	0	0	0	0	1	0	0	3	8	126	97	
B	4	7	11	5	2	9	0	32	6	1	77	54	420	359	
Non A – Non B	0	3	1	1	0	0	0	2	0	0	7	5	39	42	
Unspecified	0	0	0	0	0	0	0	0	0	0	0	4	15	24	
Meningitis															
Aseptic	1	1	2	3	3	11	3	20	1	9	54	13	172	156	
H. influenza	5	0	2	1	9	1	6	6	14	1	45	16	172	108	
Meningococcal	0	0	4	0	1	0	0	0	3	1	9	7	40	46	
Other	3	1	4	3	3	2	0	3	2	3	24	5	123	47	
Enteric Infections															
Campylobacter	1	1	3	2	11	4	4	10	1	9	46	43	281	304	
Salmonella	6	4	7	10	15	4	4	13	17	6	86	161	728	690	
Shigella	0	0	1	2	1	0	0	8	6	2	20	13	89	143	
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	3	6	6	
Parasitic Infections															
Amebiasis	0	0	0	0	0	0	0	1	2	0	3	4	26	28	
Giardiasis	27	7	21	9	21	13	3	6	0	21	128	95	516	458	
Toxoplasmosis	5	0	0	19	1	1	0	3	3	1	33	4	78	19	
Sexually Transmitted Dis.															
AIDS	0	0	0	0	3	0	0	4	6	2	15	13	92	52	
Gonorrhea	47	42	122	78	153	41	31	1005	1016	411	2946	3455	18712	20023	
Genital Herpes	8	5	41	5	9	18	6	75	43	54	264	227	1648	1534	
Nongonococcal urethritis	22	5	45	9	65	13	27	207	543	310	1246	1326	7753	7895	
Primary & secondary syphilis	3	1	0	3	0	0	0	7	1	1	16	30	110	133	
Tuberculosis															
Extrapulmonary	0	0	2	2	4	1	0	5	3	2	19	8	68	49	
Pulmonary	0	1	7	4	7	3	2	6	15	10	55	64	270	262	
Zoonotic															
Animal Bites	15	11	8	9	28	50	23	1	6	0	151	61	1092	350	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Rabies (Animal)	0	1	4	1	1	0	1	0	0	0	8	0	75	57	
Rocky Mtn. Spotted Fever	0	1	0	2	3	0	0	0	0	0	6	1	26	10	
Tularemia	0	0	2	1	3	0	0	0	0	2	8	4	32	35	

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 2
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious) - 8
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionnellosis - 1
Leptospirosis - 1
Lymphogranuloma Venereum
Malaria - 1
Plague
Rabies (human)
Reye's Syndrome
Toxic-Shock Syndrome - 7
Trichinosis

Outbreaks

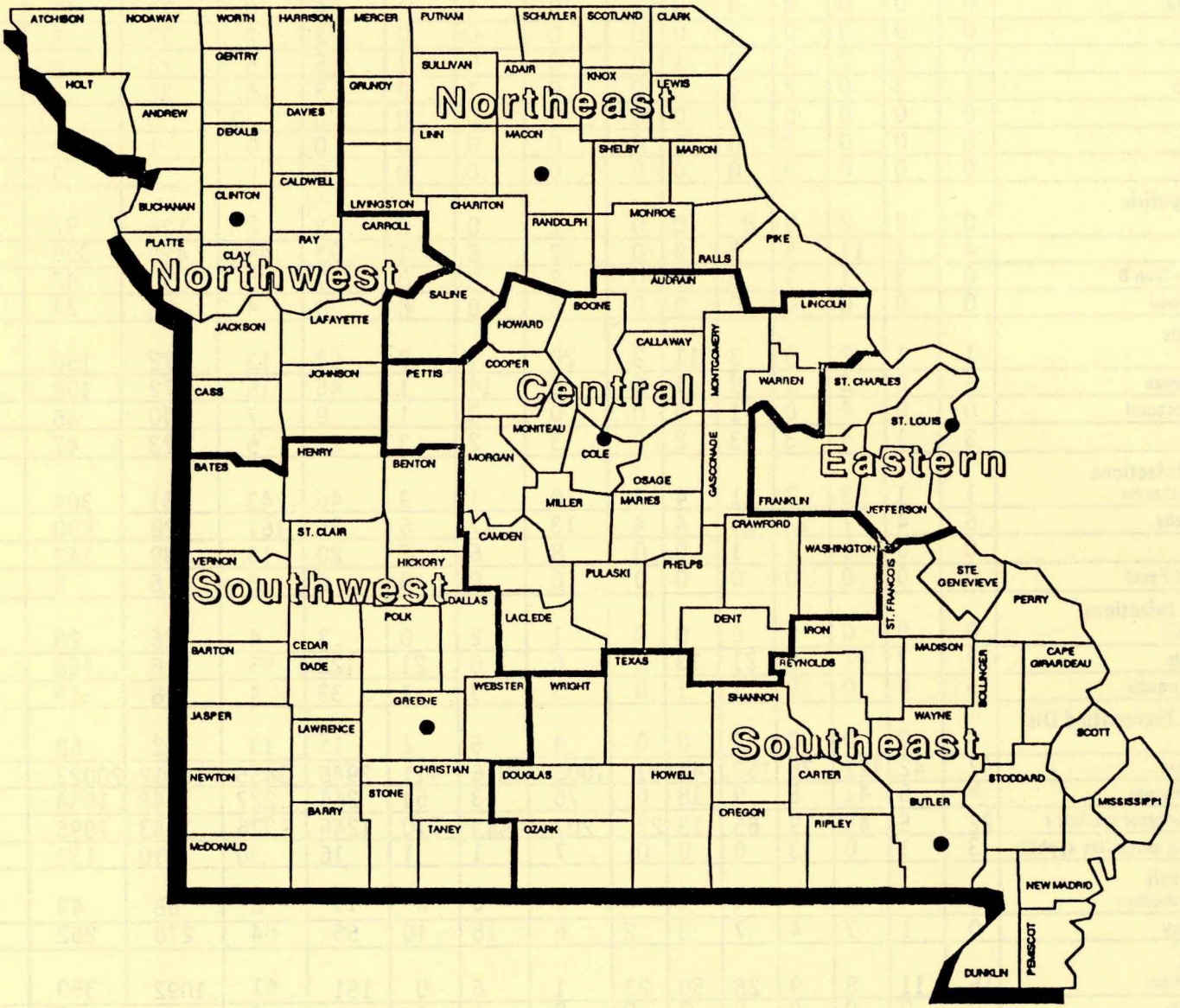
Foodborne/waterborne - 3
Histoplasmosis
Nosocomial
Pediculosis
Scabies
Other

*Reporting Period Beginning November 2, Ending December 31.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



Northwestern District	(formerly Dist. #1 & 6)	219 North Chestnut, Box 230, Cameron, MO 64429	**816 / 632-2107**
Northeastern District	(formerly Dist. #2)	123 North Allen, Macon, MO 63552	**816 / 385-3125**
Central District	(formerly Dist. #3)	907 Missouri Blvd., Jefferson City, MO 65101	**314 / 751-4216**
Southeastern District	(formerly Dist. #4)	1812 South Broadway, Poplar Bluff, MO 63901	**314 / 785-9634**
Southwestern District	(formerly Dist. #5)	1150 East Latoka, P.O. Box 777, Springfield, MO 65801	**417 / 883-1555**
Eastern District	(formerly Dist. #7)	59th & Arsenal, Suite 200, St. Louis, MO 63139	**314 / 781-7825**

Missouri
EPIDEMIOLOGIST

Vol. IX, No. 2 *March / April 1987*

Penicillinase Producing *Neisseria Gonorrhoeae* (PPNG)

By Bill Huber
Missouri Department of Health
Bureau of Sexually Transmitted Diseases

United States

Penicillinase producing *Neisseria gonorrhoeae* (PPNG) are gonococcal strains that have acquired the ability to synthesize beta-lactamase, an enzyme that makes penicillin ineffective in the treatment of gonorrhea. While most strains of *N. gonorrhoeae* in the United States are susceptible to a broad range of antimicrobial agents, resistance to penicillin is a rapidly growing problem.

PPNG was first discovered in 1976 and the incidence rose slowly through the early 1980s with most infections traced to imported cases. Reported cases have more than doubled annually since 1984 and most cases are no longer linked to overseas travel or importations.

PPNG has been reported from all areas of the United States with major outbreaks occurring in Florida, Los Angeles, New York and Philadelphia. A total of 16,554 cases of PPNG were reported in 1986 in the United States.

Missouri

Missouri has experienced sporadic outbreaks in the major urban areas and in association with the

(continued on page 2)

Figure 1

Penicillinase Producing *Neisseria Gonorrhoeae*
State of Missouri
1977 - 1986

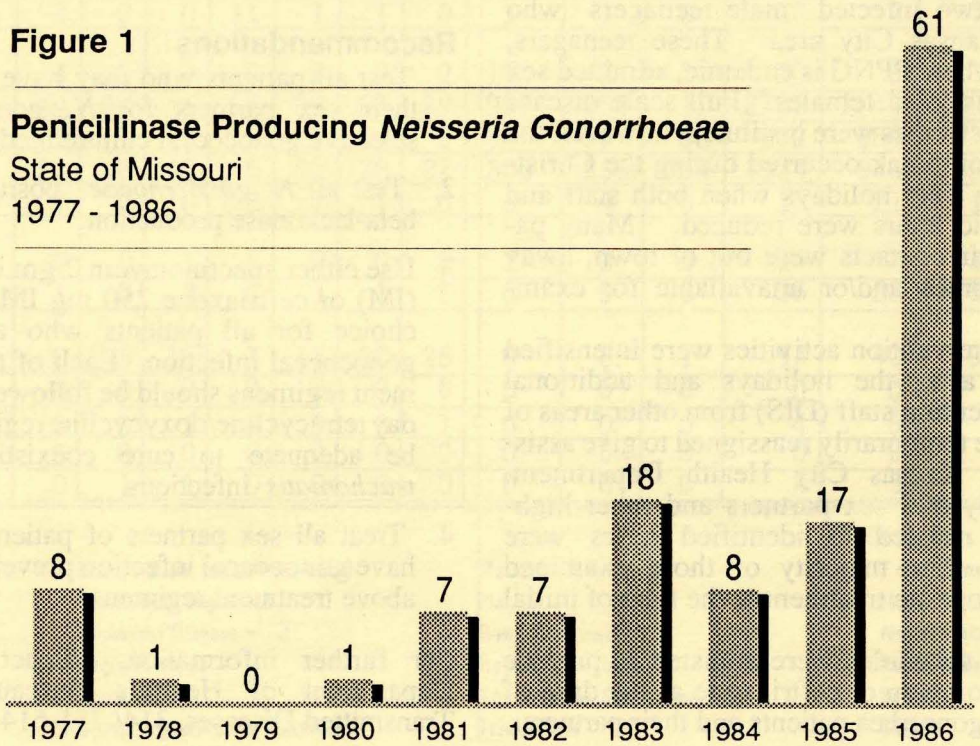
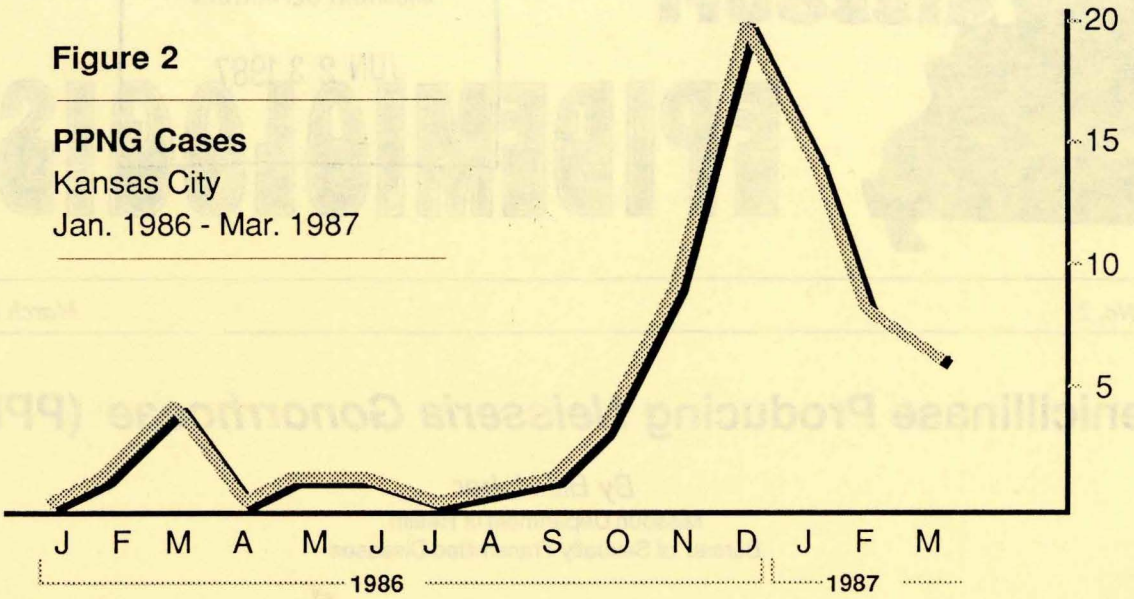


Figure 2

PPNG Cases
Kansas City
Jan. 1986 - Mar. 1987



military bases since 1977. Most outbreaks responded to intensive disease intervention techniques and soon were brought under control.

Kansas City

Occasional cases of PPNG have been reported by the Kansas City Health Department since 1977. However, a dramatic and significant increase occurred during the last four months of 1986 when 34 cases were identified and during the first three months of 1987 when 29 cases were reported.

Investigation revealed the index case may have been one of two infected male teenagers who visited the Kansas City area. These teenagers, from Miami where PPNG is endemic, admitted sex with numerous local females. Full scale disease intervention activities were instituted; however, the height of the outbreak occurred during the Christmas and New Year holidays when both staff and available clinic hours were reduced. Many patients and their contacts were out of town, away from their homes and/or unavailable for examination.

Disease intervention activities were intensified immediately after the holidays and additional disease intervention staff (DIS) from other areas of Missouri were temporarily reassigned to give assistance to the Kansas City Health Department. Approximately 500 sex partners and other high-risk persons related to identified cases were investigated. The majority of those examined received appropriate treatment at the time of initial examination.

Treatment schedules were adjusted to provide either spectinomycin or ceftriaxone as the drug of choice for all gonorrhea patients and their partners.

A high percentage of cases involved in this outbreak were drug abusers, prostitutes, topless dancers and their associates. These people were often difficult to motivate for examination and made the disease intervention process slow and dangerous for the DIS staff. The outbreak continues at this time, but at a much lower rate of occurrence.

The Bureau of Sexually Transmitted Diseases recommends the following diagnostic and treatment guidelines for all patients evaluated in the Kansas City area at this time:

Recommendations

1. Test all patients who may have gonorrhea and their sex partners for *N. gonorrhoeae* with selective gonococcal culture medium.
2. Test all *N. gonorrhoeae* positive isolates for beta-lactamase production.
3. Use either spectinomycin 2 gm intramuscularly (IM) or ceftriaxone 250 mg IM as the drug of choice for all patients who are treated for gonococcal infection. Each of the above treatment regimens should be followed with a seven-day tetracycline/doxycycline regimen which will be adequate to cure coexisting *Chlamydia trachomatis* infections.
4. Treat all sex partners of patients suspected to have gonococcal infection preventively with the above treatment regimens.

For further information, contact the Missouri Department of Health's Bureau of Sexually Transmitted Diseases, 314/ 751-6141. ■

Immunization of Children Infected with Human Immunodeficiency Virus (HIV)

THE IMMUNIZATION PRACTICES ADVISORY COMMITTEE (ACIP) RECENTLY ISSUED THE FOLLOWING RECOMMENDATIONS FOR IMMUNIZATION OF CHILDREN INFECTED WITH HIV, THE AIDS VIRUS.

Adapted from *MMWR* 1986; 35: 595-606.

Children with symptomatic HIV infection

A. Live-virus and live-bacterial vaccines (e.g., MMR , OPV, BCG) should not be given to children and young adults who are immunosuppressed in association with AIDS or other clinical manifestations of HIV infection. For routine immunizations, these persons should receive inactivated polio vaccine (IPV) and should be excused for medical reasons from regulations requiring measles, rubella and/or mumps immunization.

B. Concerns have been raised that stimulation of the immune system by immunization with inactivated vaccines in these individuals might cause deterioration in immunologic function. However, such effects have not been noted thus far among children with AIDS or among other immunosuppressed individuals after immunization with inactivated vaccines. The potential benefits of immunization of these children outweigh the concerns of theoretical adverse events. Immunization with DTP, IPV, and *haemophilus influenzae* type b (Hib) vaccines is recommended in accordance with the ACIP recommendations, although immunization may be less effective than it would be for immunocompetent children.

C. As with other conditions that produce chronic immunosuppression, the Committee recommends annual immunization with inactivated influenza vaccine for children over six months of age and one-time administration of pneumococcal vaccine for children over two years of age.

D. Children and young adults with AIDS or other clinical manifestations of infection — as other immunosuppressed patients — may be at increased risk of having serious complications of infectious diseases, such as measles and varicella. Following significant exposure to measles or varicella, these persons should receive passive immunization with immune globulin (IG) or varicella-zoster immune globulin (VZIG), respectively.*

*Some physicians administer full replacement doses of intravenous IG on a 2-4 week schedule to children with AIDS or other clinical manifestations of HIV infection. This therapy may provide some protection against such diseases as measles and varicella.

Children with previously diagnosed asymptomatic HIV infection

A. A small number of children and young adults known to be infected with HIV but without overt clinical manifestations of immunosuppression have received live-virus vaccines without adverse consequences. Further experience needs to be monitored, but on the basis of data now available the Committee believes that such persons should be vaccinated with MMR in accordance with ACIP recommendations. Vaccinees should be followed for possible adverse reactions and for the occurrence of vaccine-preventable diseases since immunization may be less effective than for uninfected persons.

B. Available data suggest that OPV can be administered without adverse consequences to HIV-infected children who do not have overt clinical manifestations of immunosuppression. However, because family of such children may be immunocompromised due to AIDS or HIV infection and therefore at increased risk of paralysis from contact with spread vaccine virus, it may be prudent to use IPV routinely to

immunize asymptomatic children with previously diagnosed HIV infection.

C. Immunization with DTP and Hib vaccines is recommended in accordance with ACIP recommendations.

Children not known to be infected with HIV

Children and young adults not known to be infected with HTLV-III/LAV should be immunized in accordance with ACIP recommendations.

Children residing in the household of a patient with AIDS

Children whose household members are known to be immunocompromised due to AIDS or other HIV infections should not receive OPV because vaccine viruses are excreted by the recipient of the vaccine and may be communicable to their immunosuppressed contacts. There children should receive IPV for routine immunization. Because extensive experience has shown that live, attenuated MMR vaccine viruses are not transmitted from vaccinated individuals to others, MMR may be given to a child residing in the household of a patient with AIDS.

Missouri EPIDEMIOLOGIST

Published by the
Missouri Department of Health
Division of Environmental Health
and Epidemiology Services
P.O. Box 570, 1730 E. Elm Street
Jefferson City, MO 65102-0570
Telephone: (314) 751-6080
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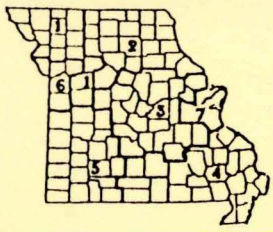


MISSOURI DEPARTMENT OF HEALTH – Epidemiology Services – Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period* January and February , 1987

	DISTRICTS							Kansas City	St. Louis City	St. Louis County	2 Month State Totals		Cumulative for 1987	Cumulative for 1986	5 Year Median
	1	2	3	4	5	** 6	** 7				1987	1986			
Vaccine Preventable Dis.															
Chickenpox	214	100	433	476	775	395	24	1	0	0	2418	1011	2418	1011	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	1	2	15	8	7	1	1	3	1	0	39	35	39	35	
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mumps	0	1	0	0	0	0	0	0	0	2	3	3	3	3	
Pertussis	3	0	0	1	1	3	0	1	0	0	9	1	9	1	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubella	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Viral Hepatitis															
A	5	1	4	1	1	1	1	0	0	1	15	19	15	19	
B	0	2	7	2	3	3	1	4	1	5	28	74	28	74	
Non A – Non B	1	0	2	0	1	1	0	0	0	1	6	2	6	2	
Unspecified	2	0	0	0	0	0	0	0	0	0	2	2	2	2	
Meningitis															
Aseptic	0	2	1	0	2	0	0	6	0	0	11	3	11	3	
H. influenza	0	0	5	1	3	0	1	6	0	4	20	29	20	29	
Meningococcal	1	0	0	1	0	0	0	3	1	2	8	6	8	6	
Other	0	0	3	1	3	1	1	1	0	1	11	14	11	14	
Enteric Infections															
Campylobacter	3	2	1	1	5	1	6	1	1	5	26	23	26	23	
Salmonella	2	0	4	2	5	1	4	7	12	8	45	61	45	61	
Shigella	0	0	0	0	2	0	0	1	7	2	12	7	12	7	
Typhoid Fever	0	0	1	0	0	0	0	0	1	0	2	1	2	1	
Parasitic Infections															
Amebiasis	0	0	0	0	0	0	0	1	1	0	2	1	2	1	
Giardiasis	18	1	13	2	11	14	5	0	0	3	67	46	67	46	
Toxoplasmosis	3	0	0	11	1	1	0	1	1	0	18	4	18	4	
Sexually Transmitted Dis.															
AIDS	3	0	3	0	2	0	0	16	3	3	30	9	30	9	
Gonorrhea	58	25	121	66	98	87	29	931	954	417	2786	2744	2786	2744	
Genital Herpes	3	7	17	5	5	24	9	54	56	52	232	284	232	284	
Nongonococcal urethritis	21	8	48	6	53	28	22	308	536	304	1334	943	1334	943	
Primary & secondary syphilis	1	0	0	3	1	1	0	3	4	0	13	21	13	21	
Tuberculosis															
Extrapulmonary	0	0	1	4	0	0	0	3	3	3	14	2	14	2	
Pulmonary	1	0	3	6	3	1	2	6	5	8	35	22	35	22	
Zoonotic															
Animal Bites	0	3	13	7	11	32	28	0	2	1	97	40	97	40	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rabies (Animal)	0	0	1	2	0	0	1	0	0	0	4	5	4	5	
Rocky Mtn. Spotted Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tularemia	0	1	1	0	0	0	0	0	0	0	2	3	2	3	

Low Frequency Diseases

- Anthrax
- Botulism
- Brucellosis – 5
- Chancroid
- Cholera
- Cryptosporidiosis
- Encephalitis (infectious)
- Encephalitis (viral/arbo-viral)
- Granuloma Inguinale
- Kawasaki Disease – 2
- Legionnellosis – 2
- Leptospirosis – 1
- Lymphogranuloma Venereum
- Malaria – 1
- Plague
- Rabies (human)
- Reye's Syndrome
- Toxic-Shock Syndrome – 2
- Trichinosis

Outbreaks

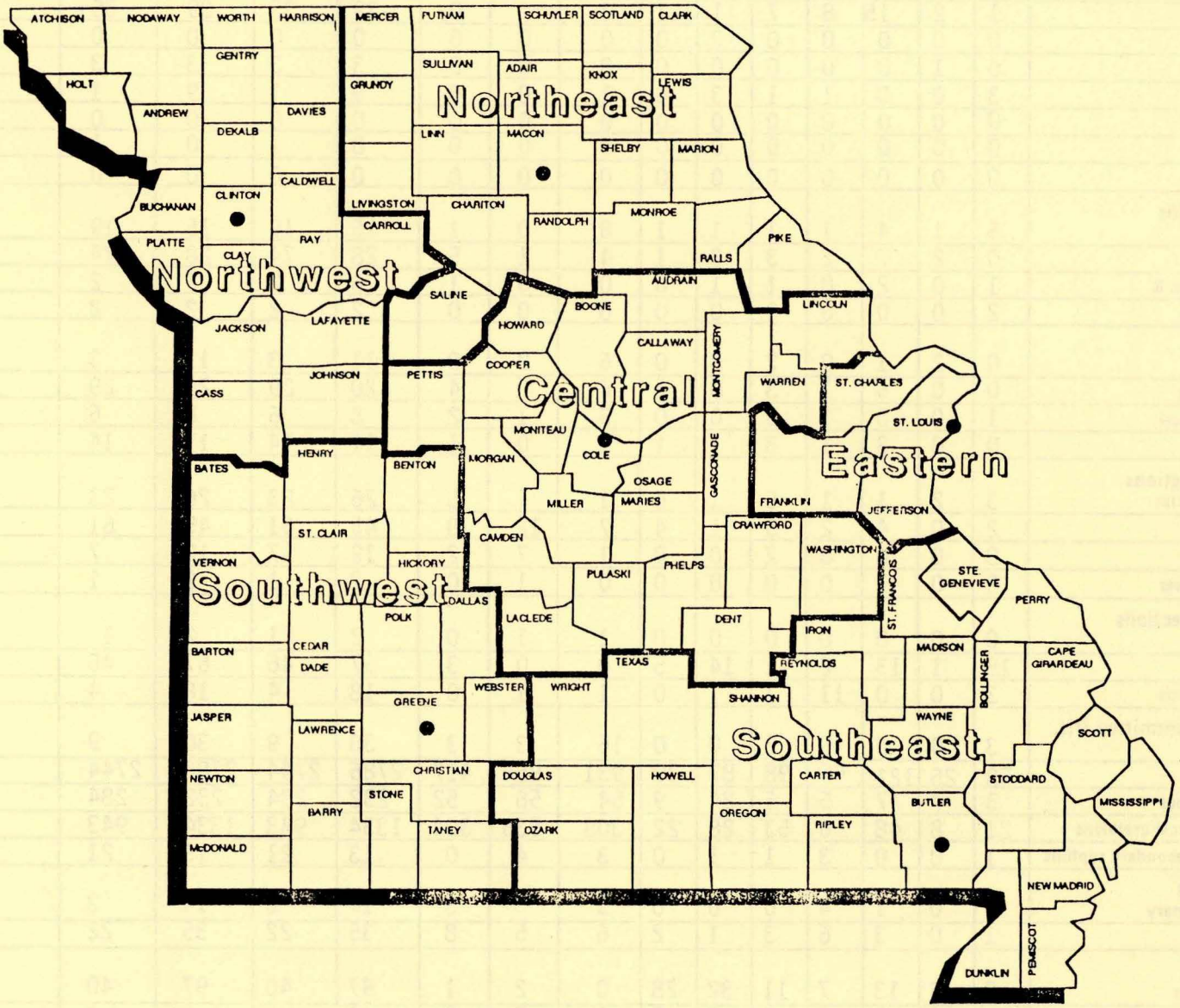
- Foodborne/waterborne – 1
- Histoplasmosis
- Nosocomial
- Pediculosis
- Scabies
- Other

*Reporting Period Beginning Jan 4, Ending Feb 28.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



Northwestern District	(formerly Dist. #1 & 6)	219 North Chestnut, Box 230, Cameron, MO 64429	**816 / 632-2107**
Northeastern District	(formerly Dist. #2)	123 North Allen, Macon, MO 63552	**816 / 385-3125**
Central District	(formerly Dist. #3)	907 Missouri Blvd., Jefferson City, MO 65101	**314 / 751-4216**
Southeastern District	(formerly Dist. #4)	1812 South Broadway, Poplar Bluff, MO 63901	**314 / 785-9634**
Southwestern District	(formerly Dist. #5)	1150 East Latoka, P.O. Box 777, Springfield, MO 65801	**417 / 883-1555**
Eastern District	(formerly Dist. #7)	59th & Arsenal, Suite 200, St. Louis, MO 63139	**314 / 781-7825**

Missouri EPIDEMIOLOGIST

Vol. IX, No 3 *May / June 1987*

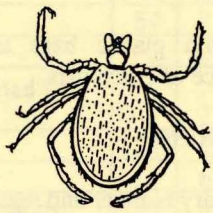
'Tis the Season for TICKS

by F.T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

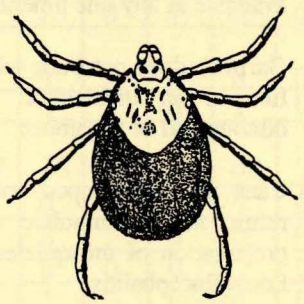
Mother Nature provides climatic conditions from May through September which necessitate little alterations for pleasant living unless, of course, you are into cooling the air via air conditioner rather than the bubbling brook or neighborhood pool.

Unfortunately, what is provided for Homosapien is also provided for the rest of the creatures. Thus, flies, fleas, mosquitoes and ticks abound. Tick-borne diseases of concern to Missourians include **Rocky Mountain Spotted Fever, Tularemia, Lyme Disease** and **Ehrlichiosis.**

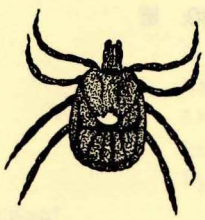
COMMON TICKS IN MISSOURI



Ixodes scapularis
Black-legged tick



Dermacentor andersoni
Rocky Mountain
wood tick



Amblyomma americanum
lone star tick

TICK FACTS

* Ticks are blood-sucking arachnids capable of transmitting serious and sometimes fatal illness.
* Late spring and summer are peak times for exposure to ticks.
* Ninety-four percent of cases of tick-transmitted diseases occur between April 1 and September 30.
* Most tick bites resolve uneventfully.
* Victims are seldom aware of crawling ticks or even the process of attachment.
* Ticks transfer infection only after they have fed for several hours and are engorged.

TICK REMOVAL PROCEDURE

It is suggested that the mechanical removal technique be used for all tick removal

* It is important to remove a tick from the host as soon as possible after it is discovered.
* Proper tick removal is as important in reducing the chance of infection as timely removal.
* Exercise the same precautions when removing ticks from animals as when removing ticks from humans.

IN THIS ISSUE...

REMOVING A TICK

1. Disinfect the site prior to tick removal.
2. Grasp the tick close to the skin using blunt curved forceps or tweezers. If fingers are used shield them with tissue, paper towels or rubber gloves.
3. Pull upward with steady, even pressure. DO NOT twist or jerk as this may cause mouthparts to break off in the skin.
4. Take care not to squeeze, crush, or puncture the body of the tick as its fluids may contain infective agents.
5. After removing the tick, thoroughly disinfect the bite site and wash hands with soap and water.
6. Safely dispose of the tick by placing it in a container of alcohol or flushing it down the toilet.
7. DO NOT handle ticks with bare hands as infectious agents may enter via mucous membranes or breaks in the skin.

PERSONAL PREVENTION

* Avoid known tick-infested areas.
* Apply repellents such as diethyltoluamide (Deet) and dimethylphthalate to clothing and exposed parts of the body. (These repellents are active ingredients in many popular insect repellents. Read ingredient labels.)
* Wear clothing that interferes with tick attachment (boots, full length and one piece outer garments).
* Avoid sitting on grass and logs where exposure to ticks increases.
* Every 4-6 hours, inspect entire body including hairy parts, to detect and remove attached ticks.

ENVIRONMENTAL PREVENTION

* Keep weeds and grass cut in yards and recreational areas.
* Clear brush along paths.
* Remove ticks from dogs to minimize the tick population in areas near residences.

For more information, contact the Bureau of Veterinary Public Health, Phone 314/ 751-6136. ■

Sanitary Practices in Refuse Management

by Fred G. Unnewehr
Bureau of Community Sanitation

With the advent of warm weather associated with spring and summer months, special precautions are essential in preventing vermin propagation in garbage and other refuse.

Although improper storage and disposal of refuse during the winter months offer food and harbor for rodent populations, the summer months contribute large populations of disease-carrying flies and mosquitoes, which also contribute to the spread of disease to humans.

10 Rules to Reduce Vermin

1. Control fly infestation. (Fly control is 90% sanitation]
2. Store refuse in vermin-proof containers and keep lids closed.
3. Keep storage areas clean and free of spillage.
4. Twice a week collection service is essential during fly-breeding season.
5. In business districts, all refuse should be collected daily.
6. Line refuse containers with plastic bags and drain garbage to aid in maintenance of containers.
7. Eliminate harbor areas for rodents.
8. Maintain pet pens in a sanitary manner and regulate food available at any one time to prevent feeding by rodents.
9. Garbage does not burn without the aid of an auxilliary fuel in an incinerator. Open burning should be discouraged or prohibited.
10. Cans and other open containers normally present in refuse may accumulate water and contribute to the propagation of mosquitoes known to be vectors of St. Louis Encephalitis.

For more information, contact the Bureau of Community Sanitation, phone 314/ 751-6090. ■

Preventing Food Outbreaks from Poultry

by David Stull, C.P.S., M.P.A.
Bureau of Community Sanitation

Reports from the United States Department of Agriculture have recently stated that nearly 40 percent of the United States poultry supply is contaminated with salmonella. For public health purposes, one should assume that 100 percent of the poultry is contaminated with salmonella bacteria. The following public health controls are suggested to prevent foodborne disease outbreaks associated with poultry.

Temperature is the first and best control. All poultry products must be stored at 45°F or colder. This does not kill the bacteria but slows its growth. If the poultry is frozen, thaw slowly under refrigeration or cold running water. It may also be thawed as part of a continuous cooking process in an oven. In cooking poultry products, heat all parts to at least 165°F to kill live bacteria. If the poultry product is to be kept hot, it must be kept at 140°F or more which prevents new bacterial growth.

Efforts must be made not to contaminate other food products with bacteria from poultry products (specially food that will not be further cooked). Proper washing and sanitizing of all surfaces coming in contact with poultry such as cutting boards, knives and counter tops (the sanitizer can be a 1/2 ounce of chlorine bleach in 1 gallon of water) should be done before processing any other food items. Care should be taken not to store raw poultry products in close proximity to ready-to-eat foods, such as salads.

Special precautions should be taken with leftovers. When cooling poultry, rapidly cool to below 45°F from the hot storage temperature of over 140°F. Then, when reheating, rapidly reheat the poultry to 165°F to kill all new salmonella cells.

These general temperature controls together with common sanitary precautions will provide safe poultry products and prevent the possibility of a foodborne disease outbreak.

For further information, contact the Bureau of Community Sanitation, phone 314/ 751-6090. ■

Radon Testing in Joplin and Flat River Areas

By Patrick E. Phillips, D.V.M., M.S.P.H.

In January and February 1986, homes in the Joplin and Flat River areas were surveyed for radon and radon-daughter concentrations. The surveys were conducted by members of the Department of Health and local health agencies according to the Environmental Protection Agency (EPA) "Five-Minute Grab Sample" procedure and using equipment on loan from EPA.

A total of 108 homes were sampled (64 in Joplin and 44 in Flat River). From this number, 35 homes were selected for follow-up monitoring to determine an annual average for each home for exposure risk assessment.

To develop the annual average for each home, continuous air sampling for seven consecutive days was conducted four times (once each season) during the year. Complete data points were collected for 28 of the 35 homes (15/18 in Joplin and 13/17 in Flat River).

None of the homes exceeded .02 Working Level (WL) which is the accepted standard indicating increased health risk. Four of the homes had levels of radon-daughters that exceeded normal background and therefore require further monitoring. Results for the remaining homes were below .01 WL and considered at no additional risk for health effects due to radon.

Approximately 250 homes located throughout Missouri are currently being monitored and their results will be reported in the next issue. ■

Missouri
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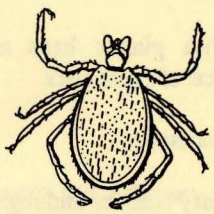
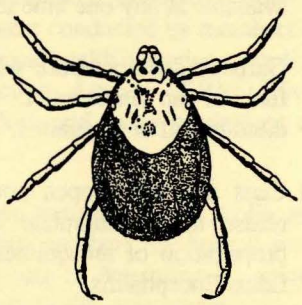
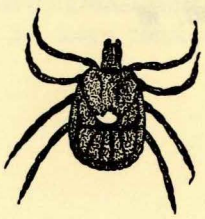


Ixodes scapularis
Black-legged tick



Dermacentor andersoni
Rocky Mountain
wood tick



Amblyomma americanum
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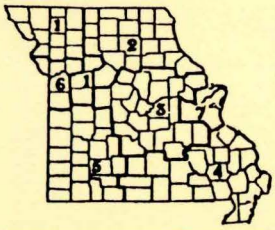

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Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	0	0	1	1	2	0	1	0	1	0	6	34	57	69	
Measles	0	1	30	1	0	0	0	0	0	3	35	3	35	3	
Mumps	0	3	2	1	1	1	0	0	1	1	10	5	13	8	
Pertussis	1	2	1	0	0	0	0	0	0	0	4	3	13	4	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Viral Hepatitis															
A	1	0	4	3	11	4	0	4	2	0	29	21	44	40	
B	2	5	7	5	6	13	11	32	13	12	106	73	134	147	
Non A – Non B	0	0	0	0	2	1	1	3	0	1	8	7	14	9	
Unspecified	2	0	3	0	0	0	0	0	0	0	5	4	7	6	
Meningitis															
Aseptic	0	1	4	0	1	1	0	1	0	2	10	13	20	16	
H. influenza	1	4	1	2	4	2	1	5	4	10	34	32	54	61	
Meningococcal	1	1	1	2	0	0	0	2	1	0	8	12	16	18	
Other	0	2	2	4	1	3	2	2	0	3	19	30	30	44	
Enteric Infections															
Campylobacter	0	0	4	1	10	2	1	6	0	6	30	27	56	50	
Salmonella	5	0	35	9	15	6	5	18	23	3	119	77	164	138	
Shigella	2	5	1	1	0	0	0	3	5	3	20	9	32	16	
Typhoid Fever	0	0	0	0	0	0	0	0	1	0	1	1	3	2	
Parasitic Infections															
Amebiasis	0	0	0	0	0	0	0	0	1	0	1	5	3	6	
Giardiasis	54	2	9	5	7	5	3	2	2	4	93	63	160	109	
Toxoplasmosis	2	0	1	11	2	1	0	4	5	0	26	7	44	11	
Sexually Transmitted Dis.															
AIDS	0	1	1	1	2	0	2	4	4	4	19	8	49	17	
Gonorrhea	122	19	77	67	113	68	27	830	819	309	2451	3018	5237	5762	
Genital Herpes	7	6	71	5	6	12	9	59	61	55	291	285	523	569	
Nongonococcal urethritis	24	5	47	33	69	25	19	208	510	284	1224	1330	2558	2273	
Primary & secondary syphilis	0	0	2	0	1	0	0	3	3	0	9	24	22	45	
Tuberculosis															
Extrapulmonary	0	0	1	0	0	0	0	3	0	0	4	20	18	23	
Pulmonary	1	1	3	3	8	1	0	7	7	7	38	39	73	67	
Zoonotic															
Animal Bites	60	17	15	10	28	80	50	0	1	441	702	210	799	250	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rabies (Animal)	0	1	5	7	0	0	0	0	0	0	13	16	17	21	
Rocky Mtn. Spotted Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tularemia	0	0	1	3	0	0	0	0	2	0	6	1	7	4	

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 4
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)- 2
Granuloma Inguinale
Kawasaki Disease- 1
Legionnellosis- 5
Leptospirosis - 1
Lymphogranuloma Venereum
Malaria
Plague
Rabies (human)
Reye's Syndrome
Toxic-Shock Syndrome - 4
Trichinosis

Outbreaks

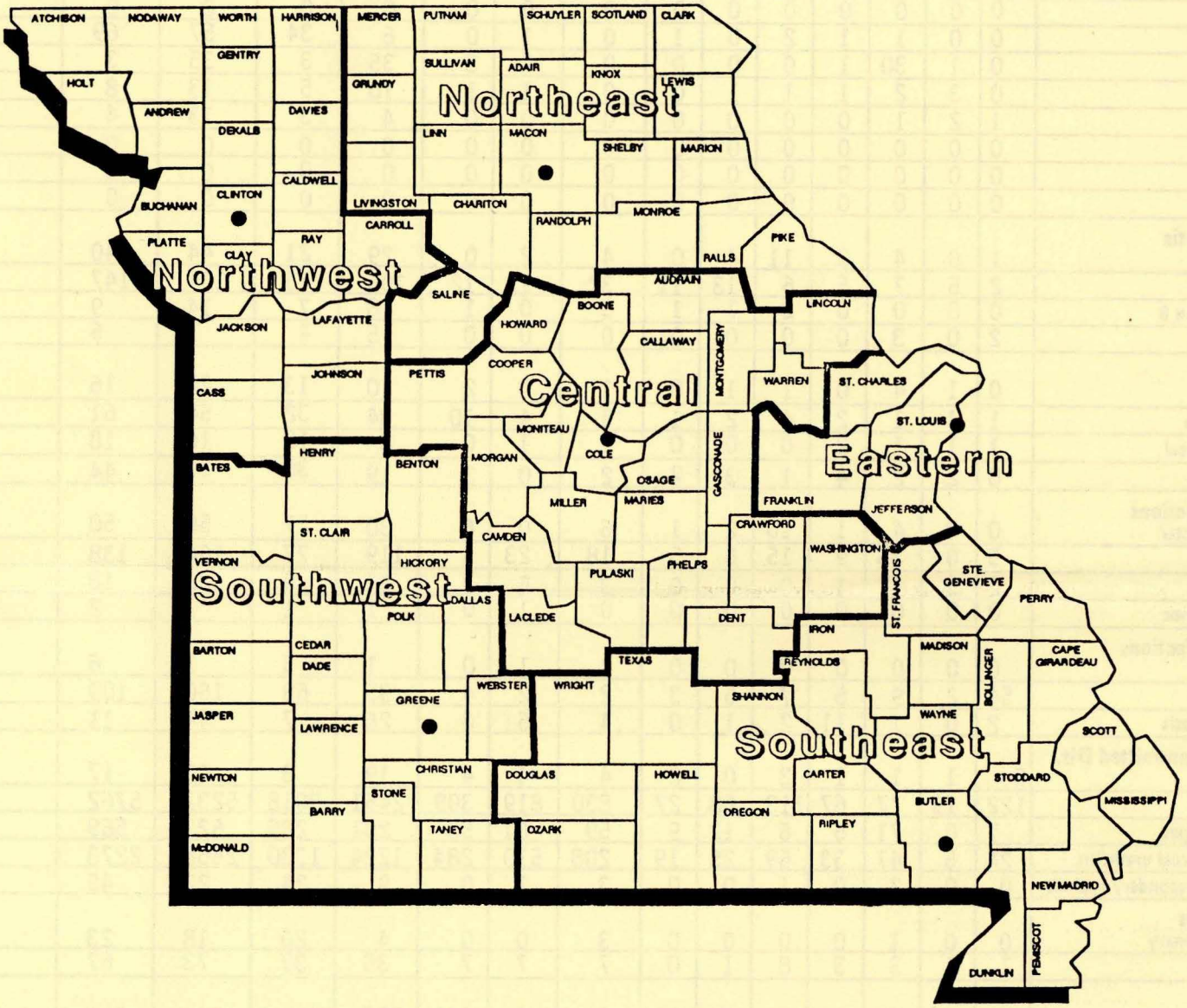
Foodborne/waterborne - 1
Histoplasmosis
Nosocomial
Pediculosis
Scabies - 2
Other - 1

*Reporting Period Beginning March 01, Ending May 02.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



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Southeastern District	(formerly Dist. #4)	1812 South Broadway, Poplar Bluff, MO 63901	**314 / 785-9634**
Southwestern District	(formerly Dist. #5)	1150 East Latoka, P.O. Box 777, Springfield, MO 65801	**417 / 883-1555**
Eastern District	(formerly Dist. #7)	59th & Arsenal, Suite 200, St. Louis, MO 63139	**314 / 781-7825**

Missouri EPIDEMIOLOGIST

Vol. IX, No. 4 *July-August 1987*

1987 MEASLES EPIDEMIC IN MISSOURI

by Irene Donelon, Bureau of Immunization

Missouri

To date in Missouri over 350 cases of rash illnesses have been investigated and 178 cases of measles have been reported. This is the highest incidence level since the 1979 epidemic which produced 436 reportable cases. This year's outbreak centered in Boone County where 124 (69.7%) cases were reported.

Columbia

The first reported case of measles in the state occurred in Columbia with a rash onset on January 31, 1987. The index case, an unimmunized 18-month-old child, had been vacationing with her family in their home country of Saudia Arabia. The subsequent rapid spread was attributed to a skating guard at a local rink who directly infected nine contacts, students at six different local public schools.

The outbreak in Columbia continued for over four months, the most recent rash onset occurring on June 6, 1987, with a total of 114 cases. Hardest hit was the 15-19 year age group with 56 reported cases, 48 of which attended Hickman High School. The attack rate for Hickman was 28 cases per 1,000 students.

Public gatherings, including a presidential visit and parade, a skating meet, and several state tournaments, hampered control efforts.

During the outbreak surveillance was intensified, the media were notified, and school immunization records were audited for compliance. During the month of March, the Columbia-Boone County Health Department sponsored two free immunization clinics where over 400 measles vaccines were administered. The student health clinic at the University of Missouri-Columbia administered over 1,400 doses of measles vaccine.

Fortunately, the outbreak did not affect the university and college campuses. There was one reported case at Columbia College and one at the University of Missouri-Columbia (UMC). The UMC student's rash onset was on the last day of exams, which was the same day she left for her hometown. No additional campus-linked cases have been attributed to either of these students.

Missouri - 1987
Measles Cases by County

County	Cases	Percentage
Audrain	18	10.1
Benton	1	0.6
Boone	124	69.7
Carroll	2	1.1
Carter	1	0.6
Clay	16	9.0
Clinton	1	0.6
Henry	1	0.6
Jackson	3	1.7
Linn	7	3.9
Platte	1	0.6
St. Louis	3	1.7

Of the 178 measles cases, 71 were confirmed by serology and the remaining 107 were linked epidemiologically. School age children, ages 5-19 years, accounted for 127 (71.4%) of the cases. Immunization status and age at immunization of the affected cases follows:

Missouri - 1987
Measles Cases by Age at Vaccination

Age at Vaccination	Total Cases	Percentage
<12 months	10	5.6
12-14 months	54	30.3
≥15 months	63	35.4
not immunized	51	28.7
Total	178	100.0

According to the MMWR, the incidence of measles has declined dramatically from the levels reported in the prevaccine era. However, in recent years there have been an increasing number of cases reported annually. A substantial portion of these cases continue to occur in appropriately vaccinated individuals. Some studies have demonstrated lower vaccine efficacy and higher attack rates in persons vaccinated at 12-14 months of age compared with those vaccinated at the currently recommended age of 15 months. While routine revaccination of persons vaccinated at 12-14 months of age is not recommended in Missouri, revaccination during selected outbreaks should be considered.

For more information, contact the Bureau of Immunization, (314) 751-6133. ■

Vaccine-Preventable Diseases in Children Infected with Human Immunodeficiency Virus (HIV)

The Centers for Disease Control in Atlanta have received two reported cases of children with Acquired Immunodeficiency Syndrome (AIDS) who died of measles-pneumonia. These are the first deaths attributed to measles since 1983. CDC and the Missouri Department of Health feel it is important to ascertain if HIV-infected children, like children with leukemia or with other immunodeficiencies, are at increased risk of serious complications of measles and varicella. Such patients should be reported by telephone to the Bureau of Immunization (314/ 751-6133).

Passive immunization with immune globulin is indicated for a symptomatic HIV-infected child with significant exposure to measles or varicella. The two reported deaths from measles suggests that HIV infected children may be at increased risk of severe measles disease. Health care providers should be encouraged to evaluate children who present with measles-pneumonia and encepahlitis and their families for possible risk factors for HIV infection. These risk factors include having a parent with AIDS or an increased risk for AIDS, receiving transfusions of blood or blood products and having hemophilia or other coagulation disorders. Voluntary serologic testing accompanied by counseling is recommended for those children with complications of measles who have risk factors for HIV infections.

Immune-deficient individuals have a higher risk of developing vaccine-associated poliomyelitis than normal individuals (either as vaccine recipients or contacts). Measles-pneumonia has been reported in leukemic children given a less-attenuated measles vaccine than is currently used in the United States. In order to assess the risk and benefits of immunization of HIV-infected children with live virus vaccines, it is important to determine if these children are at increased risk of vaccine-associated adverse events.

The Bureau of Immunization would like to receive reports of HIV-infected children who develop neurologic illness (particularly paralytic disease) following receipt of OPV or contact with an OPV recipient. Formulation of appropriate immunization policies for HIV-infected children in the United States requires a knowledge of risk of vaccine-associated adverse events and the risk of severe complications of vaccine-preventable diseases. Your help and assistance in acquiring this information is greatly needed.

Further more information contact the Bureau of Immunization (314) 751-6133. ■

Radon Monitoring in Missouri Homes

by Ross Brownson, Ph.D.
Bureau of Cancer Epidemiology and Control

The Bureau of Cancer Epidemiology and Control recently completed a statewide radon monitoring survey. The radon survey, conducted in collaboration with the National Cancer Institute, was part of a feasibility study for a larger epidemiologic study of lung cancer among nonsmoking Missouri women.

Radon detection devices (alpha track detectors) were placed in the homes of state and local health department employees throughout the state. Twelve different health departments were used as distribution centers. Monitors were distributed according to population density (St. Louis and Kansas City received approximately one-half of all detectors.) A total of 253 detectors were distributed, representing 24 counties. Monitors were placed in the homes for a minimum of three months.

Six detectors were lost or improperly handled. Results are based on 247 measurements. The range of readings was <0.3 pCi/l to 45 pCi/l and the median value was 2.7 pCi/l. There were 14.2 percent (35 measurements) of the values above the Environmental Protection Agency "action level" of 4 pCi/l.

The radon monitoring data were analyzed separately for the St. Louis and Kansas City areas versus the rest of the state in order to determine the relative urban-rural distribution of readings. The St. Louis and Kansas City areas comprise 54 percent of the state's population. The results showed 13.8 percent of the measurements above 4 pCi/l for St. Louis and Kansas City versus 14.6 percent for the rest of the statewide readings. In the Kansas City area, 20.0 percent of the measurements were above 4 pCi/l. It should be noted that these measurements were taken during the winter months and therefore are probably higher than those based on year-long readings.

For more information, contact Bureau of Cancer Epidemiology and Control, (314) 875-2218. ■

Health and Environment Digest Available

The *Health & Environment Digest* is a new monthly newsletter that provides the physician, public health and occupational health professional with credible, medically accurate information on key health concerns related to air, land, and water quality. Each issue contains timely feature articles on current topics, commentary by noted national experts, a clinical question-and-answer section, and comprehensive state-by-state updates on toxicological research, epidemiological studies, new legislation, and monitoring and management programs. Early issues of the *Digest* covered pesticides, passive smoke, radon, asbestos, dioxins, and chlorination byproducts. Future issues will cover low level radioactive waste, solid waste disposal and waste incineration, indoor air pollution, and risk assessment.

The *Digest* is published by the Health and Environmen Network, which represents expertise from 50 state health departments, 22 government agencies, state public heatlh associations, and medical societies. Accuracy is assured by an editorial board of distinguished nationally-recognized experts of environmental health.

For a free complimentary copy of the *Health and Environment Digest,* write or call:

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Minneapolis, MN 55429
(612) 533-6162

Phone Number Reminders:

For Consultation regarding Animal Bites or Communicable Diseases:

Toll free (800) 392-0272
8:00-5:00

or (314) 751-6400
after hours

CONFERENCE ANNOUNCEMENT

Directions in Cancer Control

October 8, 1987
9:00 a.m. to 4:30 p.m.
Holiday Inn Executive Center, Columbia

This one-day conference is designed for a diverse audience of primary care, public health and school health professionals; health educators; and community leaders. Focusing on avoidable morbidity and mortality, the conference is designed to stimulate interest in cancer control and to give information and practical techniques. Topics include:

- ✓ Prevention and cessation of tobacco use including smokeless tobacco and smoking cessation during pregnancy
- ✓ Building geographical and social access to screening
- ✓ Psychological barriers to cancer screening
- ✓ Minority cancer control issues

Co-sponsors:
Department of Health,
Ellis Fischel State Cancer Center
Missouri Division of the
American Cancer Society

Registration fee: $15
(includes lunch/ break)

To register, contact:

Marilyn Lake
Bureau of Cancer Epidemiology and Control
P.O. Box 1268
Columbia, MO 65205
(314) 875-2264

Missouri EPIDEMIOLOGIST

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Published by the
Missouri Department of Health
Division of Environmental Health
and Epidemiology Services
P.O. Box 570, 1730 E. Elm Street
Jefferson City, MO 65102-0570
Telephone: (314) 751-6080
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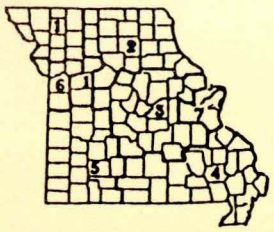


MISSOURI DEPARTMENT OF HEALTH – Epidemiology Services – Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period* May and June , 19 87

	DISTRICTS							Kansas City	St. Louis City	St. Louis County	2 Month State Totals		Cumulative for	Cumulative for	5 Year Median
	1	2	3	4	5	** 6	** 7				1987	1986	1987	1986	
Vaccine Preventable Dis.															
Chickenpox	162	91	78	198	83	263	41	2	0	0	919	954	6840	4122	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	0	0	0	0	0	0	0	0	0	0	0	3	57	72	
Measles	3	5	61	0	1	11	0	1	0	0	82	18	118	21	
Mumps	0	0	1	0	0	1	0	1	0	3	6	0	19	8	
Pertussis	0	0	2	0	0	0	0	1	0	1	4	1	17	5	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Tetanus	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Viral Hepatitis															
A	0	0	10	2	3	5	0	12	1	1	34	39	78	79	
B	2	3	11	7	4	4	2	13	6	10	62	67	194	214	
Non A – Non B	0	0	0	0	0	0	1	0	1	4	6	10	20	19	
Unspecified	1	0	0	0	0	1	0	1	0	0	3	5	10	11	
Meningitis															
Aseptic	0	2	0	2	0	3	1	8	1	2	19	6	39	22	
H. influenza	0	0	1	2	2	1	2	3	2	2	15	18	69	79	
Meningococcal	1	0	0	0	1	0	0	1	1	0	4	2	20	20	
Other	1	0	0	2	2	2	1	1	0	1	10	10	40	54	
Enteric Infections															
Campylobacter	4	2	6	0	6	4	4	14	5	9	54	34	110	84	
Salmonella	3	3	12	13	10	4	9	12	15	12	93	107	257	245	
Shigella	0	0	7	0	1	1	1	3	8	7	28	10	60	26	
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	2	3	4	
Parasitic Infections															
Amebiasis	0	0	0	1	0	0	0	0	0	0	1	5	4	11	
Giardiasis	20	13	14	2	1	1	1	6	3	4	65	41	225	150	
Toxoplasmosis	4	0	0	9	4	0	0	6	4	1	28	2	73	13	
Sexually Transmitted Dis.															
AIDS	0	0	5	0	4	0	0	10	5	2	26	13	75	30	
Gonorrhea	75	31	116	68	138	71	35	931	1012	384	2861	3590	5312	6608	
Genital Herpes	6	2	9	6	11	15	5	64	29	23	170	354	461	639	
Nongonococcal urethritis*	21	6	47	32	12	25	24	246	646	324	1383	1424	2607	2754	
Primary & secondary syphilis	0	0	0	2	0	1	0	9	2	2	16	23	25	47	
Tuberculosis															
Extrapulmonary	1	0	1	1	2	0	0	1	9	0	15	10	33	33	
Pulmonary	2	0	3	9	7	0	4	10	17	5	57	48	129	115	
Zoonotic															
Animal Bites	41	32	24	27	39	165	24	1	1	406	760	162	1559	412	
Psittacosis	0	0	1	0	0	0	0	0	0	0	1	0	1	0	
Rabies (Animal)	1	0	2	6	2	0	0	0	0	0	11	24	28	45	
Rocky Mtn. Spotted Fever	0	1	1	2	0	0	0	0	0	0	4	3	4	3	
Tularemia	0	0	3	3	0	0	0	0	0	0	6	3	14	7	

Low Frequency Diseases

Anthrax
Botulism
Brucellosis – 1
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease
Legionnellosis – 2
Leptospirosis
Lymphogranuloma Venereum
Malaria – 2
Plague
Rabies (human)
Reye's Syndrome – 1
Toxic-Shock Syndrome
Trichinosis

Outbreaks

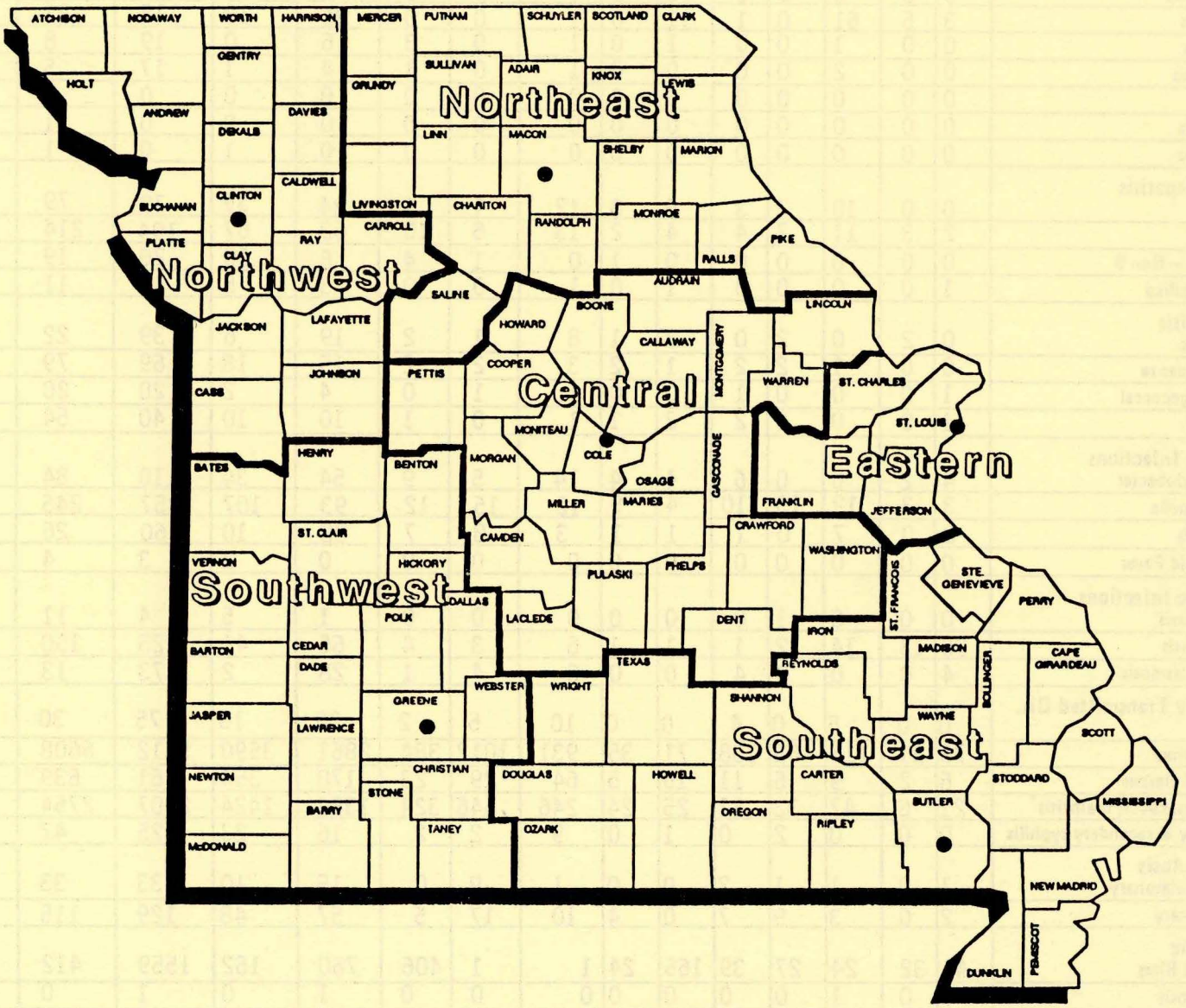
Foodborne/waterborne – 3
Histoplasmosis
Nosocomial – 1
Pediculosis
Scabies
Other – 1

*Reporting Period Beginning May 3, Ending June 27.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



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Missouri EPIDEMIOLOGIST

Vol. IX, No. 5 *September - October 1987*

Missouri Adipose Tissue Study of Exposed and Unexposed Persons to 2,3,7,8-Tetrachlorodibenzo-p-dioxin

by Daryl W. Roberts, M.Ed.
Bureau of Environmental Epidemiology

INTRODUCTION

Sludge wastes contaminated with approximately 29 kilograms of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) originating, as a by-product of hexachlorophene production in a southwes Missouri plant, was mixed in 1971 with waste oils and sprayed for dust control throughout the state. Almost 250 residential, commercial , and recreational areas (including several horse arenas) were thought to be contaminated, including the town of Times Beach. Forty-five sites have been confirmed as having at least 1 part per billion (ppb) of TCDD in the soil. At one of these sites, levels as high as 33,000 ppb were measured. Isolated levels of more than 2,000 ppb were found in some contaminated areas, but most detectable levels in soil samples ranged from several hundred ppb to less than 1 ppb. Almost one-half (46.7%) of the confirmed sites were contaminated with peak levels in excess of 100 ppb, and 57% of these were in residential areas.

In 1971, when the first contaminations occurred, the Department of Health (DOH) worked closely with the Center for Disease Control (CDC), Center for Environmental Health (CEH), to determine the contaminant in the waste oil after hemorrhagic cystitis was reported in an exposed child.[1] The investigation culminated in laboratory identification in 1974 of TCDD in the waste oil. With further discoveries of widespread contaminations in mid-1982, the DOH and CDC initiated various public health activities. These activities included a Health Effects Questionnaire that was used to collect baseline and identifying information on potentially exposed persons. From the questionnaire, a group was chosen for a Pilot Epidemiologic Study.[2]

Other activities included a major medical epidemiologic study of former residents of the Quail Run Mobile Home Park in Gray Summit, Missouri[3] and a Reproductive Outcomes Study[4] of women potentially exposed to TCDD. Finally, an Adipose Tissue Study[5] and a Serum Dioxin Study[6] were conducted to determine levels of dioxin in humans.

ADIPOSE TISSUE STUDY

Exact determination of an individual's exposure to dioxin is complex, and, until recently, has only been a gross estimate based on historical information. In the last few years, methods based on gas chromatography-mass spectrometry have been developed to measure TCDD in human adipose tissue. The development of an objective, laboratory-based measure of exposure ensures determination of who has and who has not been significantly exposed, and minimizes misclassification errors in studies of the association of TCDD exposure with health effects.

The Adipose Tissue Study was designed as a cross-sectional comparison of adipose (fat) tissue TCDD levels in persons who

IN THIS ISSUE...

were thought to have been exposed to TCDD and of persons with no known exposure to TCDD. For the exposed population, volunteers were sought from individuals who had lived at the Quail Run Mobile Home Park in Gray Summit, Missouri. Fewer than 50 participants were recruited from this group, so invitations for volunteers were sent to all high risk members of the central listing. Also, invitations were mailed to all former production/plant workers in Verona, Missouri.

Persons with no known exposure were recruited from among persons who were undergoing elective abdominal surgery in each of three hospitals in Kansas City, Springfield, or St. Louis. Residents of Kansas who met the protocol requirements were also eligible for the study if they were having elective surgery at any of the three hospitals. After obtaining physician approval, all patients who consented were asked to answer a questionnaire. They were considered to have no known exposure if they did not meet any of the exposure criteria and if the soil in areas where they lived or worked was not known to be greater than 1 ppb.

A total of 51 exposed and 128 unexposed persons volunteered for the study. The exposed group consisted of 16 (31.4%) individuals from the Springfield area and 35 (68.6%) from the St. Louis area. The exposed group involved volunteers from various subgroups; such as 19 (37.3%) occupationally exposed (9 in production and 10 various other occupations), 16 (31.4%) exposed at horse arenas, and 16 (31.4%) from residential sites. The no known exposure group was recruited from Kansas City (37 or 28.9%), St. Louis (49 or 38.3%), and Springfield (42 or 32.8%).

All but one person in both the exposed and no known exposure groups had detectable levels of TCDD in their adipose tissue. Twenty-nine (57%) of the 51 exposed persons had measurements higher than the highest TCDD level (20.2) measured in the group with no known exposure. Eleven (21.6%) of the exposed group had TCDD levels greater than 100 ppt. Importantly 22 (43.1%) of the persons with residential, recreational, and occupational exposure had TCDD levels less that 20.2 ppt. (20.2 ppt was the highest TCDD level found in the group of persons with no known exposure.)

For persons with occupational exposure, the mean adipose TCDD level was 122.9 parts per trillion (ppt) with a range of 3.7 - 750.0 ppt; for persons with recreational exposure, 145.6 ppt with a range of 5.0 - 577.0 ppt; for persons with residential exposure, 26.8 ppt with a range of 5.2 - 59.1 ppt; and for persons not known to be exposed, 7.0 ppt with a range of undetected to 20.2 ppt. For persons with no known exposure, 95% of the adipose tissue dioxin concentrations was 16.6 ppt or less.

The intent of this study was to determine whether concentrations of TCDD in adipose tissue differ in exposed and unexposed persons, and whether TCDD levels are associated with specific demographic and exposure characteristics. Clearly, the results of the study determined that a significant difference in TCDD body burden exists in some individuals exposed to dioxin. Also, the findings indicate adipose TCDD levels observed in this study in persons with no known exposure are similar to the levels seen in autopsy specimen studies previously reported. Significantly, some persons who were thought to have been exposed to TCDD based on epidemiologic evidence did not show evidence of exposure based on objective laboratory data. This suggests that for future studies of TCDD exposure, it is important to have an objective measure of exposure before proceeding to look at outcome such as health effects or biological markers.

The measurement of dioxin in adipose tissue is a much improved exposure index for studies evaluating the possible health effects of TCDD, and it greatly diminishes the problem of misclassification. Unfortunately, the use of an adipose specimen requires that a surgical procedure, thus precluding its widespread use. This problem is being overcome by the development of a method for measuring TCDD in serum.

ADIPOSE TISSUE MEDICAL FOLLOW-UP

A continuation and expansion of the Adipose Tissue Study was a clinical evaluation of all of the exposed participants. The purpose of the testing was to determine if clinical or subclinical abnormalities were present in the group and, if present, to determine if a dose-response relationship existed.

All 51 of the exposed participants in the Adipose Tissue Study were eligible to participate in the medical evaluation. Invitations to the follow-up were mailed to the 49 participants remaining alive, with 41 (84%) volunteering for the evaluation.

Each participant completed an update questionnaire concerning their medical, residential, and occupational history since completion of a previous interview. A board-certified internist administered a standardized physical examination concentrating on evaluation of the skin, lymph nodes, liver, and peripheral nervous system. Laboratory tests included a complete blood count with differential,
Chem 23 (automated chemistry test), serum immunoglobulins, in vitro lymphocyte tests, lymphocyte proliferation responses, a urine test for porphyrins, and liver function serum tests.

The follow-up group was almost equally distributed between subgroups of adipose tissue results: 16 participants with tissue dioxin levels less than 20 ppt, 12 with levels between 21 and 60 ppt, and 12 members with levels greater than 60 ppt.

The physical examinations revealed no apparent patterns. Individual participants exhibited excursions from normal; however, they were not clustered in any particular subgroup. Likewise, there were generally no statistically significant differences noted in the laboratory and skin test results. One

exception was a finding of higher globulin levels, and consequent lower albumin/globulin ratios, in the greater-than-60 ppt subgroup. While the significance of this is unknown, it may simply be due to age and gender differences in the subgroups and the resulting loss of efficiency as these factors are controlled for in the analysis.

The in vitro immune tests revealed suggestions of increasing abnormality associated with increasing TCDD body burden. Specifically, there was a clustering of participants with low T4/T8 ratios in the high body burden group. The low ratios were caused primarily by increases in T8 cells; secondarily by decreases in T4 cells. Increases were also noted in the T3 and T11 percentages and in the IGG levels. However, no anergy was found, even in the participants with the highest TCDD body burdens and, as in previous studies, there was no clinical evidence of immunosuppression activity.

Given the inherent limitations of this follow-up study, the results must be interpreted with caution. While the immune tests indicate an area of potential concern, the lack of any clinical evidence of immunosuppression may be viewed positively. The long-term human health effects of TCDD exposure are still largely unknown.

ADIPOSE TISSUE AND SERUM DIOXIN LEVEL CORRELATION

The primary disadvantage of collecting adipose tissue samples for determination of dioxin body burden is that a surgical procedure is required for taking the sample. A biological specimen, such as blood or its components, that could be obtained through a less invasive procedure and would be available from all participants is highly desirable. Since a serum blood test has recently been developed by the Division of Environmental Health Laboratory Sciences, Center for Environmental Health, CDC, a study was designed to determine how well adipose tissue and serum levels of TCDD correlated on either a whole-weight or lipid-weight basis.

Paired human serum and adipose tissue samples from 50 persons were analyzed for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), using high-resolution gas chromatography/high-resolution mass spectrometry (HRGC/HRMS). On a lipid weight basis, the range of values in adipose tissue spanned approximately 2.5 orders of magnitude, from 3.3 to 969 parts per trillion (ppt). After adjusting the adipose tissue TCDD and the serum TCDD levels for total lipid content, the means of the partitioning ratio of adipose tissue and serum levels of TCDD were highly correlated, $r = 0.98$.

The high correlation between serum TCDD levels and adipose tissue TCDD levels in this study indicates that serum TCDD is a valid measurement of TCDD body-burden concentrations. The practical advantage of collecting serum rather than adipose tissue samples should facilitate future epidemiologic studies that require estimates of the body burden of TCDD.

STUDY OF POLYCHLORINATED DIBENZO-P-DIOXINS AND DIBENZOFURANS PATTERNS

A substudy of the major Adipose Tissue Study was designed to determine if the concentration patterns of the other polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans also differed between a selected exposed and unexposed group. If the abnormal dioxin exposure were specifically limited to 2,3,7,8-TCDD, as it would be if the exposure were from 2,4,5-trichlorophenol related compounds, then it was expected that the pattern of the other PCDDs and PCDFs would be similar for the two groups.

Results of this analysis indicated that the adipose tissue samples of the exposed group had much higher levels of 2,3,7,8-TCDD than the unexposed, but the exposed had similar levels of the other PCDDs and PCDFs. This finding suggests that the abnormal 2,3,7,8-TCDD levels are due to a specific point source.

ADIPOSE TISSUE SUBSTUDY OF OCCUPATIONALLY EXPOSED WORKERS

Sixteen of the 19 occupationally-exposed people worked at a Missouri chemical plant which producted 2,4,5-trichlorophenoxyacetic acid (2,4,5,-T) or hexachlorophene from 2,4,5-trichlorophenol (TCP) in the late 1960's and early 1970's. 2,3,7,8-TCDD was generated as an unintended contaminant during the process of making TCP. Consequently, workers in these processes were potentially exposed to 2,3,7,8-TCDD. Three other persons reported occupational exposure at truck terminals from servicing trucks used to transport dioxin contaminated waste oils. To assess the wide range of levels of 2,3,7,8-TCDD for workers with reported occupational exposures, a review was conducted of their employment records and of the questionnaires in which they reported their opportunities for occupational exposure.

Results of the review indicated workers who made TCP had mean dioxin levels over 20 times greater than the average level of other company workers not employed in production.

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2. Stehr PA, Stein GF, Webb K, et al. A pilot epidemiologic study of possible health effects associated with 2,3,7,8-tetra- chlorodibenzo-p-dioxin contaminations in Missouri. Arch Environ Health 1986; 41:16-22.

3. Hoffman RE, Stehr-Green PA, Webb KB, et al. Health effects of long-term exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin. JAMA 1986;255:2031-2038.

4. Stockbauer JW, Hoffman RE, Schramm WF, Edmonds LD. Reproductive outcomes of mothers with potential exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin. (Part of the report submitted to the Centers for Disease Control as part of Cooperative Agreement U61/CCU700735-01).

5. Andrews JS, Garrett WA, Needham LL, et al. 2,3,7,8-tetra-chloro- dibenzo-p-dioxin levels in adipose tissue of exposed persons and in persons with no known exposure.

6. Patterson DG, Needham LL, Pirkle JL, et al. Correlation between serum and adipose levels of 2,3,7,8-tetrachlo-rodi-benzodioxin in 50 persons from Missouri. ■

INFLUENZA

The following information is excerpted from the June 26, 1987 issue of
Morbidity and Mortality Weekly Report
published by the Centers for Disease Control, Atlanta, Georgia.

The single most important measure for reducing the impact of influenza is vaccination of high-risk persons prior to the influenza season. While November is the optimal time for influenza vaccination, administration during September and October may be considered for those high-risk individuals who will not be seen during November.

Influenza vaccine is recommended for high-risk persons ≥6 months of age and for their medical-care providers or household contacts, for children and teenagers receiving long-term aspirin therapy, and for other persons wishing to reduce their chances of acquiring influenza.

Influenza vaccine for 1987-88 contains t hree inactivated virus strains:

A/Taiwan/1/86(H1N1), A/Leningrad/360/86(H3N2), and B/Ann Arbor/1/86. Since immunity declines in the year following vaccination, a history of vaccination in any previous year with a vaccine containing one or more antigens included in the current vaccine does not preclude the need to be revaccinated for the 1987-88 influenza season.

The most common side effects include soreness at injection site, fever, malaise, and myalgia. Immediate, presumably allergic, reactions such as hives, angioedema, allergic asthma, or anaphylaxis may occur, but they are extremely rare.

Groups at greatest medical risk of influenza-related complications:

1) Adults and children with chronic disorders of the cardiovascular or pulmonary systems requiring regular medical follow-up or hospitalization during the preceding year.

2) Residents of nursing homes and other chronic-care facilities housing patients of any age with chronic medical conditions.

Groups at moderate medical risk of influenza-related complications:

1) Otherwise healthy individuals ≥65 years of age.

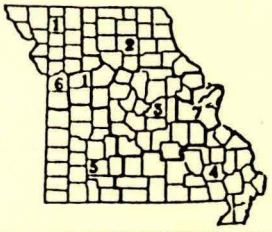
2) Adults and children who have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, anemia, or immunosuppression.

3) Children and teenagers (6 months through 18 years of age) who are receiving long-term aspirin therapy and, therefore, may be at risk of developing Reye's syndrome following influenza infection.

Groups potentially capable of nosocomial transmission of influenza to high-risk persons:

Physicians, nurses, and other personnel having extensive contact with high-risk patients (e.g., primary-care and certain specialty clinicians and staff of chronic-care facilities and intensive-care units, particularly neonatal intensive-care units).

Influenza illness is typified by an abrupt onset of fever, sore throat, and nonproductive cough. It can cause extreme malaise lasting several days. More severe disease can result if influenza virus invades the lungs (primary viral pneumonia) or if secondary bacterial pneumonia occurs. ■



MISSOURI DEPARTMENT OF HEALTH – Epidemiology Services – Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period* July and August , 19 87

	DISTRICTS							Kansas City	St. Louis City	St. Louis County	2 Month State Totals		Cumulative		
	1	2	3	4	5	** 6	** 7				1987	1986	for 1987	for 1986	5 Year Median
Vaccine Preventable Dis.															
Chickenpox	3	1	4	2	0	0	1	1	0	0	12	61	6852	4183	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	0	0	0	0	0	0	0	0	0	0	0	0	57	72	
Measles	0	3	51	0	1	6	10	1	0	0	72	10	190	31	
Mumps	0	0	0	1	0	1	0	1	0	0	3	3	22	11	
Pertussis	0	0	3	0	1	1	0	1	0	1	7	7	24	12	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tetanus	0	0	0	0	1	0	0	0	0	0	0	1	1	2	
Viral Hepatitis															
A	1	1	33	21	10	7	12	5	1	0	91	26	169	105	
B	4	12	20	13	12	4	3	11	4	9	92	66	285	280	
Non A – Non B	2	0	0	0	1	1	2	0	1	1	8	11	28	30	
Unspecified	0	0	0	0	1	2	1	0	0	1	5	3	15	14	
Meningitis															
Aseptic	0	5	5	6	5	6	3	6	1	8	45	40	83	62	
H. influenza	0	0	0	3	1	2	0	0	2	1	9	26	78	105	
Meningococcal	1	0	1	1	1	0	0	1	0	0	5	3	25	23	
Other	1	0	0	1	0	0	1	1	1	3	8	19	48	73	
Enteric Infections															
Campylobacter	3	0	6	2	13	5	4	6	0	15	54	99	164	183	
Salmonella	5	8	23	15	15	7	11	10	30	27	151	235	408	480	
Shigella	0	1	113	6	1	0	1	2	18	10	152	19	210	45	
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	1	3	5	
Parasitic Infections															
Amebiasis	0	0	1	1	0	0	0	2	0	0	4	6	8	17	
Giardiasis	5	9	64	8	26	15	8	1	1	17	154	78	379	228	
Toxoplasmosis	1	0	0	1	0	1	0	0	0	0	3	0	76	13	
Sexually Transmitted Dis.															
AIDS	0	1	0	0	2	2	0	22	9	4	40	24	115	54	
Gonorrhea	58	48	121	105	120	73	27	919	1032	346	2849	3169	8161	9777	
Genital Herpes	5	0	15	9	12	20	8	72	53	29	223	163	684	802	
Nongonococcal urethritis	6	3	37	29	17	15	30	305	729	336	1507	1549	4114	4303	
Primary & secondary syphilis	0	0	2	4	6	0	0	16	6	2	36	13	61	60	
Tuberculosis															
Extrapulmonary	1	0	0	2	1	0	0	0	3	0	7	9	40	42	
Pulmonary	2	3	7	13	12	0	0	9	9	6	61	54	190	169	
Zoonotic															
Animal Bites	23	25	15	25	18	73	24	2	1	222	428	272	1987	684	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	1	1	1	
Rabies (Animal)	0	1	0	5	4	0	0	0	0	3	13	17	41	62	
Rocky Mtn. Spotted Fever	0	0	3	1	2	5	1	0	0	0	12	12	16	15	
Tularemia	1	0	3	5	3	1	0	1	1	0	15	13	29	20	

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease – 1
Legionnellosis
Leptospirosis – 1
Lymphogranuloma Venereum
Malaria
Plague
Rabies (human)
Reye's Syndrome
Toxic-Shock Syndrome
Trichinosis

Outbreaks

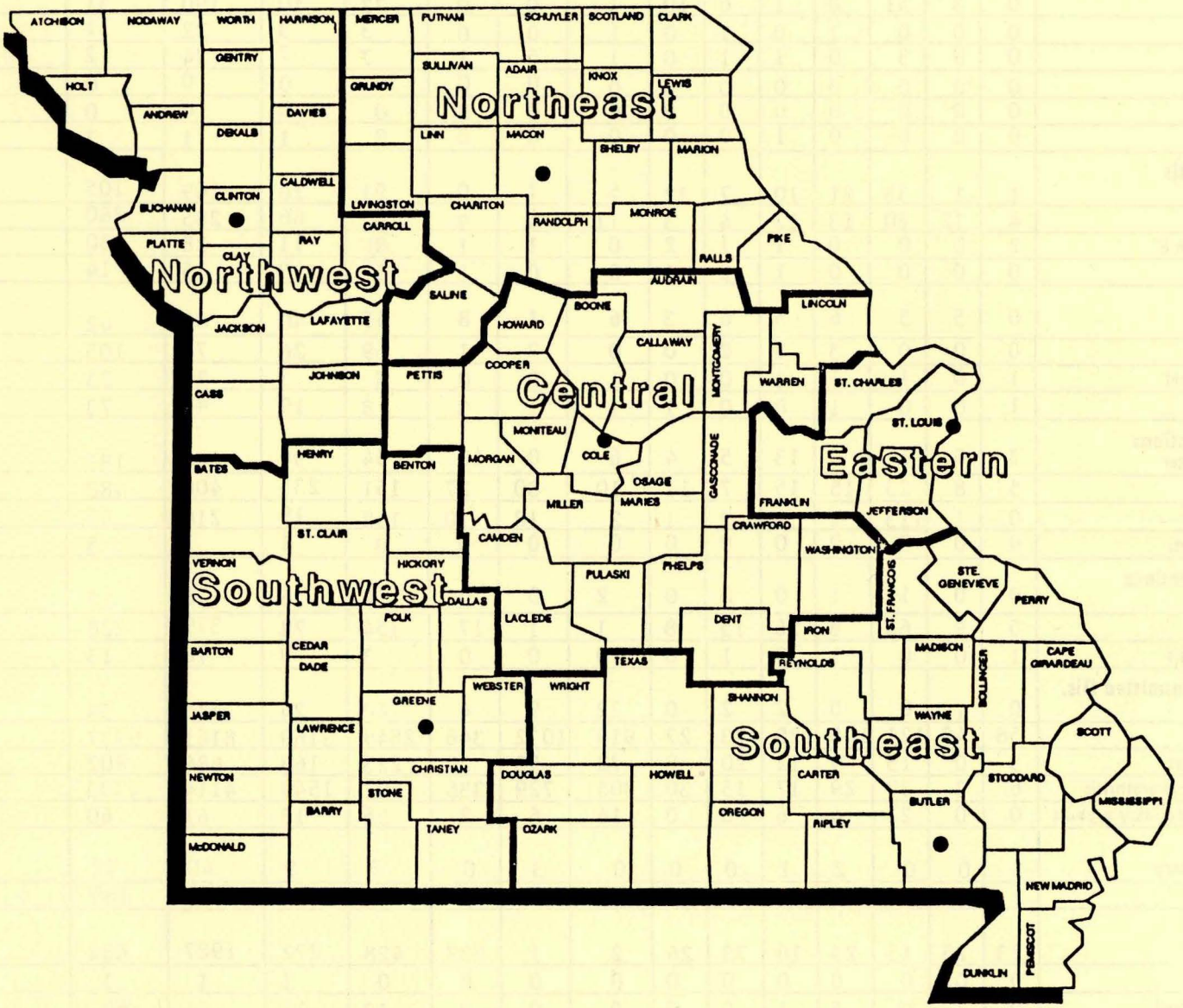
Foodborne/waterborne
Histoplasmosis
Nosocomial – 1
Pediculosis
Scabies
Other – 5
Shigella (2)
Salmonella
Giardia
Boils

*Reporting Period Beginning June 28, Ending Aug. 29.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



Northwestern District	(formerly Dist. #1 & 6)	219 North Chestnut, Box 230, Cameron, MO 64429	**816 / 632-2107**
Northeastern District	(formerly Dist. #2)	123 North Allen, Macon, MO 63552	**816 / 385-3125**
Central District	(formerly Dist. #3)	907 Missouri Blvd., Jefferson City, MO 65101	**314 / 751-4216**
Southeastern District	(formerly Dist. #4)	1812 South Broadway, Poplar Bluff, MO 63901	**314 / 785-9634**
Southwestern District	(formerly Dist. #5)	1150 East Latoka, P.O. Box 777, Springfield, MO 65801	**417 / 883-1555**
Eastern District	(formerly Dist. #7)	59th & Arsenal, Suite 200, St. Louis, MO 63139	**314 / 781-7825**

Communicable Diseases Reporting Rule Amended

Effective October 25, 1987, Human Immunodeficiency Virus (HIV) seropositivity (confirmed) became reportable in the State of Missouri as a Category II disease. A specially-designed form to assure confidentiality has been developed for reporting confirmed HIV seropositivity. This form and other reporting forms are available through your local health department.

We are providing below an insert which can be clipped and inserted into the blue rule booklet that was mailed to you earlier this year entitled, "State Laws Accompanied by Department of Health Rules Governing the Control of Communicable and Other Diseases Dangerous to Public Health." For your convenience, we have underlined the amendments made to the rule.

(CUT HERE)

cases occurred and the name and address of the reporting physician.

(6) Any person in charge of a public or private school, summer camp or day care center shall report immediately to the local health authority the presence or suspected presence of any diseases listed in sections (1) through (4) of this rule.

(7) All local health authorities shall forward to the Department of Health reports of all diseases listed in sections (1) thorugh (4) of this rule. All reports shall be forwarded within twenty-four (24) hours after being received, according to procedures established by the Department of Health director. The local health authority shall transcribe from the original report any information necessary to carry out the required duties in 19 CSR 20-20.050 (2), (3) and (3)(A).

(8) All individual morbidity reports received by a local health authority or the Department of Health are to be considered confidential records and not public records.

Auth: sections 192.005.2 and 192.020, RSMo (1986). Original rule filed July 15, 1948, effective Sept. 13, 1948. Amended: Filed Sept. 1, 1981, effective Dec. 11, 1981. Rescinded and readopted: Filed Nov. 23, 1982, effective March 11, 1983. Emergency amendment filed June 10, 1983, effective June 20, 1983., expired Sept. 10, 1983. Amended: Filed June 10, 1983, effective Sept. 11, 1983. Amended: Filed Nov. 4, 1985, effective March 24, 1986. Amended: Filed Aug. 4, 1986, effective Oct. 11, 1986. Amended: Filed June 3, 1987, effective Oct. 25, 1987.

(FOLD HERE)

19 CSR 20-20.020 Reporting Communicable Diseases

PURPOSE: *This rule designates the diseases, disabilities and conditions that must be reported to the Department of Health. It also establishes when they must be reported, by whom and how.*

(1) Category I diseases must be reported to the Department of Health or to the local health authority within twenty-four (24) hours of suspected diagnosis by telephone, telegraph or other rapid communication, followed by a written report within seven (7) days. Category I diseases are:
Animal bites;
Botulism;
Chlamydia trachomatis infections;
Diphtheria;
Epidemics--foodborne, toxic substances and others;
Gonorrhea;
Measles;
Meningitis, Hemophilus influenzae;
Meningitis Meningococcal;
Poliomyelitis;
Rabies;
Rubella;
Syphilis; and
Typhoid Fever.

(2) Category II diseases must be reported to the Department of Health or to the local health authority on forms provided by the Department of Health within seven (7) days of suspected or established diagnosis. Category II diseases are:
Acquired immune deficiency syndrome (AIDS);
Amebiasis;
Anthrax;
Brucellosis;
Campylobacter infections;
Chancroid;
Chickenpox;
Cholera;
Disease due to mycobacteria other than tuberculosis (MOTT);
Encephalitis, infectious;

If you have questions regarding this rule change or need copies of the rule booklet mentioned above, please contact the Division of Environmental Health and Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: 314/751-6080.

Encephalitis, viral;
Genital herpes;
Giardiasis;
Granuloma inguinale;
Hepatitis A, B and non-A, non-B;
Histoplasmosis outbreaks;
Human Immunodeficiency Virus (HIV) seropositivity (confirmed);
Influenza outbreaks;
Kawasaki disease;
Legionellosis;
Leptospirosis;
Listeria monocytogenes;
Lymphogranuloma venereum;
Malaria;
Meningitis, aseptic;
Mumps;
Nongonococcal urethritis;
Nosocomial outbreaks;
Pediculosis outbreaks;
Pertussis;
Plague;
Psittacosis;
Reye syndrome;
Rocky Mountain spotted fever;
Salmonella infections;
Scabies outbreaks;
Shigella infections;
Tetanus;
Toxic shock syndrome;
Trichinosis;
Tuberculosis;
Tularemia; and
Yersinia enterocolitica.

(3) Diseases and illnesses resulting from exposure to a toxic substance or to a radioactive substance that are indicative of an occupational health, public health or environmental problem must be reported to the Department of Health or the local health authority. If such a disease or illness is verified or suspected and presents an emergency or serious threat to public health or safety, that report shall be made within twenty-four (24) hours of suspected or established diagnosis by telephone, telegraph or other rapid communication followed by a written report within seven (7) days.

Diseases or illnesses resulting from exposure to toxic substances that must be reported include, but are not limited to, the following: occupational lung disease including silicosis, asbestosis and byssinusis; occupationally-related cancers including mesothelioma; and illnesses or diseases related to pesticide poisoning.

(4) The occurrence of epidemics or outbreaks of any illness or disease which may be of public health concern, including any illness in a food handler that is potentially transmissible through food, shall be reported to the Department of Health or the local health authority by telephone, telegraph or other rapid communication within twenty-four (24) hours of suspected diagnosis followed by a written report within seven (7) days.

(5) A physician attending any person who is suffering from any disease or condition listed in sections (1) through (4) of this rule or who is suspected of having any of those diseases or conditions or who is suspected of being a carrier of any of those diseases or conditions, shall report to the Department of Health or the local health authority within the specified time that person's name, address, age, sex, race, name of disease or condition diagnosed or suspected and the date of onset of the illness.

(A) A physician attending any patient, with any disease or condition listed in sections (1) through (4) of this rule, who is in a hospital, clinic or other private or public institution may authorize, in writing, the chief executive officer or designee of the hospital, clinic or institution to submit reports of reportable diseases on patients attended by the physician at the hospital, clinic or institution. But under no other circumstances shall the physician be relieved of this reporting responsibility. Each report shall include the name, age, sex, race and the address of the patient, the disease diagnosed or suspected, the date of onset of illness and whether the patient is hospitalized. If the patient is hospitalized, the name and address of the hospital, date of report, the name and address of the attending physician and any appropriate laboratory results must be included in the report.

(B) A physician's report of epidemics as required in section (4) of this rule shall include the diagnosis or principal symptoms, the approximate number of cases, the local health authority jurisdiction within which the

Immune Globulin Preparations Safe

Contrary to rumors, there is no evidence to suggest that immune globulin has been associated with transmission of HIV. There is no reason to believe that it could transmit the virus and no reason to withhold it from contacts exposed to Hepatitis A.

Since April 1985, all donor units have been screened for HIV antibodies and repeatedly reactive units have been discarded. Although prior to April 1985 some infected donor units were used in preparation, there is no evidence that virus survived the fractionation processes used in preparing the globulin and no evidence that injections of the globulin represented the source for any case of AIDS in the U.S. In addition, laboratory studies were made by adding HIV to plasma then processing this contaminated plasma into immune globulin. No virus survived the multiple processes. Estimates suggest these processes could remove as many as 10 particles of virus from each ml., whereas best estimates are that infectious plasma from patients would contain less than 100 virus particles per ml. Thus with an extremely high degree of assurance it can be said that immune globulin does not transmit HIV or AIDS.

Reference: CDC. Safety of Therapeutic Immune Globulin Preparations with Respect to Transmission of Human T-Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus Infection, MMWR 1986; 35: 231-33. ■

HEPATITIS A OUTBREAKS IN MISSOURI

by Marhee Bright, Bureau of Communicable Diseases

Reports of hepatitis A transmission in Misssouri are up dramatically in 1987 compared with recent years, and several local and regional outbreaks have occurred. A total of 193 case reports have been received during the first 36 weeks of 1987 (through September 12). The median annual total for the period 1982-1986 was 126 cases (range 98-204).

The ratio of male to female cases is 1.2:1. The age distribution is shown in Table 1; 83% of the cases were under age 40. Geographic distribution by district is shown in Table 2. Central District has the largest number, primarily due to an ongoing outbreak in Audrain County. Two other outbreaks are in progress, in the Kansas City (NW) and Shannon County (SE) areas.

The onset dates of 183 cases occurred from January through August. The peak occurred in July with 50 cases.

Audrain County has had the largest number of cases in the state this year, with 63 reported as of September 30. The outbreak began with four cases in February in one extended family; no additional cases were detected until May. Since then hepatitis has spread to additional family members and to the community through a preschool and an employee picnic.

Control measures have included provision of hundreds of doses of immune globulin (IG) to all identified contacts of the cases. Large picnics and other activities have been restricted in an effort to prevent further spread. The outbreak peaked in June (20 cases) and July (19 cases) but four cases with onset in September have been reported.

An outbreak in Shannon County consists of 34 cases as of September 30, plus six spread cases in other Missouri counties. The source of the outbreak appears to have been a visitor from another state. Transmission initially occurred among friends and neighbors in a trailer park. Three infected persons attended a large family reunion carry-in dinner a few days before their symptoms began, with several spread cases resulting. Two of the cases worked as foodhandlers but no transmission to customers has been identified. This outbreak is still in progress despite active control efforts. IG is being provided to all identified contacts of the cases.

Approximately 60 cases of hepatitis A have been reported in the Kansas City area as of September 30. Most of the cases have occurred in one area of northeast Kansas City, with a few related cases in Clay County, Independence and Raytown. Fifteen cases occurred in September.

Rapid notification of new cases is essential if efforts to limit transmission of hepatitis A are to be effective. The outbreaks illustrate that spread to other family members and to the larger community can easily occur if contacts are not protected by prompt administration of IG. Please report new cases immediately to your local public health unit or to the Department of Health at 800/392-0272.

IG is recommended for all household, day-care, and sexual contacts of cases. It should be administered as soon as possible, but no more than two weeks after exposure. Local public health units can administer IG free of charge for this purpose. ■

Table 1

Age Group	No. of Cases	Percent of Cases
0-4	12	6.2
5-9	28	14.5
10-14	18	9.3
15-19	17	8.8
20-29	51	26.5
30-39	34	17.6
40-49	12	6.2
50-59	6	3.1
60-69	5	2.6
70-79	4	2.0
80+	1	0.5
Unknown	5	2.6
TOTAL	193	

Table 2

District	No. of Cases	Percent of Cases
CENTRAL	66	34.2
EASTERN	9	4.7
NORTHEAST	3	1.6
NORTHWEST	56	29.0
SOUTHEAST	34	17.6
SOUTHWEST	25	13.0
TOTAL	193	

Missouri EPIDEMIOLOGIST

Published by the
Missouri Department of Health
Division of Environmental Health
and Epidemiology Services
P.O. Box 570, 1730 E. Elm Street
Jefferson City, MO 65102-0570
Telephone: (314) 751-6080
Toll-free No.: 800-392-0272

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Missouri EPIDEMIOLOGIST

Vol. IX, No. 6 *November-December 1987*

IMMUNE GLOBULIN PREPARATIONS SAFE

The article regarding immune globulin in the September-October 1987 issue of "Missouri Epidemiologist" contained an important typographical error. Since the error changed the meaning of a key sentence, the article is reproduced here in its entirety. The corrected sentence is underlined.

Contrary to rumors, there is no evidence to suggest that immune globulin has been associated with transmission of HIV. There is no reason to believe that it could transmit the virus and no reason to withhold it from contacts exposed to Hepatitis A.

Since April 1985, all donor units have been screened for HIV antibodies and repeatedly reactive units have been discarded. Although prior to April 1985 some infected donor units were used in preparation, there is no evidence that virus survived the fractionation processes used in preparing the globulin and no evidence that injections of the globulin represented the source for any case of AIDS in the U.S. In addition, laboratory studies were made by adding HIV to plasma then processing this contaminated plasma into immune globulin. No virus survived the multiple processes. Estimates suggest these processes could remove as many as 10^{15} particles of virus from each ml., whereas best estimates are that infectious plasma from patients would contain less than 100 virus particles per ml. Thus with an extremely high degree of assurance it can be said that immune globulin does not transmit HIV or AIDS.

Reference: CDC. Safety of Therapeutic Immune Globulin Preparations with Respect to Transmission of Human T-Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus Infection, MMWR 1986; 35: 231-33.

HEPATITIS A IN MISSOURI
AN UPDATE

More hepatitis A cases have been reported in Missouri in 1987 than in any previous year since 1978. A total of 406 cases were reported during the first 49 weeks of 1987. The median annual total for the period 1982-1986 was 126 cases (range 98-204).

The Northwest District has had the highest number of cases, with 167 or 41 percent of the total. Southeast District is second with 85 cases (21 percent) and Central District is third with 81 cases (20 percent). When adjusted for population, the incidence rate is highest in the Southeast District, 16 cases per 100,000 persons. (See Table I)

Adolescents and young adults comprise 54 percent of the cases; only 5 percent have been preschool children. The number of cases continues to rise, with 91 reported in November and 51 in the first two weeks of December.

Local health units have been actively investigating all reported cases and offering immune globulin (IG) prophylaxis to close contacts. Other control measures have included exclusion of cases from food-handling occupations during the infectious period, and curtailment of carry-in dinners in heavily affected areas. IG was offered to the public in Nevada and surrounding counties when cases were identified in two fast food restaurants there, and rapid spread of the disease was curtailed.

Please report newly diagnosed cases promptly to your local health unit or Department of Health at **800/392-0272.**

TABLE I
Reported Hepatitis A Cases
as of December 12, 1987

District	Number of Cases	Incidence Rate per 100,000 Population
Northwest	167	14.0
Southeast	85	16.0
Central	81	14.0
Southwest	52	8.0
Eastern	14	0.8
Northeast	7	3.0
Total	406	8.0

Missouri EPIDEMIOLOGIST

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Jefferson City, MO
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Published by the
Missouri Department of Health
Division of Environmental Health
and Epidemiology Services
P.O. Box 570, 1730 E. Elm Street
Jefferson City, MO 65102-0570
Telephone: (314) 751-6080
Toll-free No.: 800-392-0272

MISSOURI DEPARTMENT OF HEALTH – Epidemiology Services – Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period* September and October , 19 87

	DISTRICTS							Kansas City	St. Louis City	St. Louis County	2 Month State Totals		Cumulative for	Cumulative for	5 Year Median
	1	2	3	4	5	** 6	** 7				1987	1986	1987	1986	
Vaccine Preventable Dis.															
Chickenpox	9	0	5	0	0	7	2	0	1	0	24	101	6876	4284	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	0	0	0	0	0	0	0	0	0	0	0	0	57	72	
Measles	0	0	0	0	0	0	0	0	0	0	0	0	190	31	
Mumps	0	0	0	3	0	0	0	0	1	1	5	6	27	17	
Pertussis	0	2	1	0	3	0	0	2	0	0	8	7	32	19	
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Viral Hepatitis															
A	0	5	16	38	14	8	2	7	0	4	94	18	263	123	
B	7	8	10	7	13	1	6	24	1	7	84	57	369	337	
Non A – Non B	0	0	1	1	0	0	0	1	1	4	8	2	36	32	
Unspecified	0	0	0	1	1	1	0	1	0	0	4	1	19	15	
Meningitis															
Aseptic	3	2	9	5	1	3	7	10	0	3	43	51	126	113	
H. influenza	1	0	1	1	4	1	1	1	0	1	11	22	89	127	
Meningococcal	0	0	0	0	0	0	0	0	0	0	0	6	25	29	
Other	0	0	2	1	1	0	1	0	1	1	7	20	55	93	
Enteric Infections															
Campylobacter	4	0	7	0	8	3	9	3	0	10	44	50	208	233	
Salmonella	7	2	26	18	19	4	16	17	22	25	156	145	564	625	
Shigella	0	11	74	2	4	1	4	0	22	22	140	23	350	68	
Typhoid Fever	0	0	0	0	0	0	0	2	0	0	2	1	5	6	
Parasitic Infections															
Amebiasis	0	0	2	1	2	0	0	1	0	4	10	6	18	23	
Giardiasis	10	8	73	8	38	9	6	3	5	20	180	142	559	370	
Toxoplasmosis	1	0	0	6	0	0	0	5	0	0	12	23	88	36	
Sexually Transmitted Dis.															
AIDS	2	0	3	3	4	4	1	14	10	8	49	19	164	73	
Gonorrhea	44	50	126	104	88	95	32	1125	1077	366	3107	3253	11268	13030	
Genital Herpes	6	18	101	10	7	21	7	58	20	31	279	298	963	1100	
Nongonococcal urethritis	20	17	62	35	5	15	23	241	655	294	1367	1025	5481	5328	
Primary & secondary syphilis	0	0	1	0	0	0	1	6	0	0	8	13	69	73	
Tuberculosis															
Extrapulmonary	0	0	0	0	1	0	0	1	1	1	4	3	44	50	
Pulmonary	2	2	4	5	4	0	1	5	10	6	39	27	227	215	
Zoonotic															
Animal Bites	3	20	22	33	34	63	22	0	14	0	211	228	2198	912	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Rabies (Animal)	0	0	4	5	1	0	0	0	0	1	11	4	53	66	
Rocky Mtn. Spotted Fever	0	0	0	0	2	0	0	0	0	0	2	3	18	18	
Tularemia	0	1	1	6	2	0	0	0	0	0	10	4	39	24	

Low Frequency Diseases

Anthrax
Botulism
Brucellosis – 1
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease – 1
Legionnellosis – 4
Leptospirosis
Lymphogranuloma Venereum
Malaria – 2
Plague
Rabies (human)
Reye's Syndrome
Toxic-Shock Syndrome – 1
Trichinosis

Outbreaks

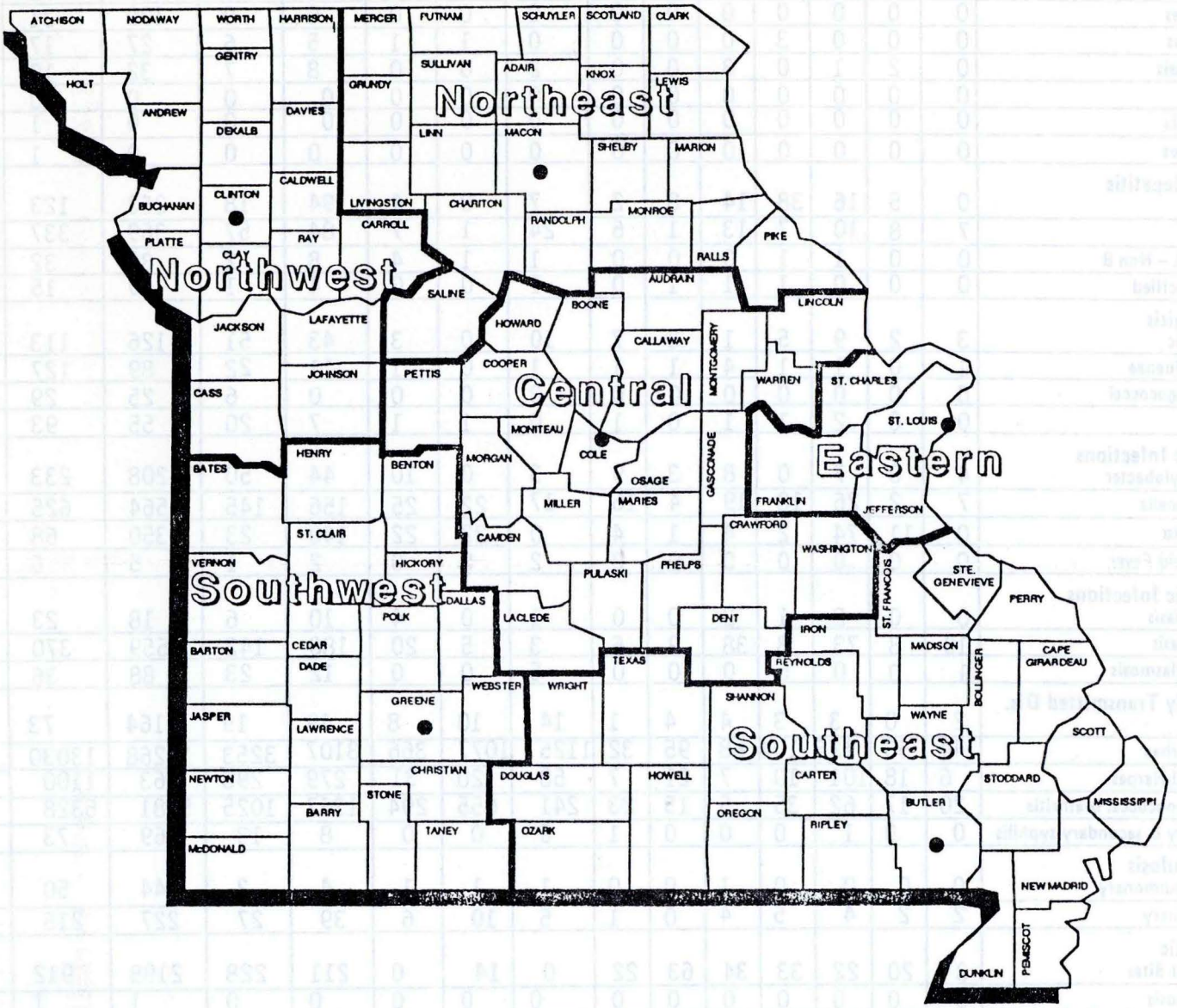
Foodborne/waterborne – 3
Histoplasmosis
Nosocomial
Pediculosis – 3
Scabies – 1
Other – 3

*Reporting Period Beginning August 30, Ending October 31.

**Totals do not include KC, SLC, or SLCo.

Due to data editing, totals may change.

Missouri Department of Health



Northwestern District	(formerly Dist. #1 & 6)	219 North Chestnut, Box 230, Cameron, MO 64429	**816 / 632-2107**
Northeastern District	(formerly Dist. #2)	123 North Allen, Macon, MO 63552	**816 / 385-3125**
Central District	(formerly Dist. #3)	907 Missouri Blvd., Jefferson City, MO 65101	**314 / 751-4216**
Southeastern District	(formerly Dist. #4)	1812 South Broadway, Poplar Bluff, MO 63901	**314 / 785-9634**
Southwestern District	(formerly Dist. #5)	1150 East Latoka, P.O. Box 777, Springfield, MO 65801	**417 / 883-1555**
Eastern District	(formerly Dist. #7)	59th & Arsenal, Suite 200, St. Louis, MO 63139	**314 / 781-7825**